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PREFACE

The findings of the *World Drug Report 2013* deliver important lessons for the forthcoming high-level review of the commitments that countries reaffirmed in 2009 on the measures for drug control. These measures are laid out in the Political Declaration and Plan of Action on International Cooperation towards an Integrated and Balanced Strategy to Counter the World Drug Problem.

At the global level, there has been an increase in the production and misuse of new psychoactive substances, that is, substances that are not under international control. The manufacture and use of substances that are under international control remain largely stable as compared with 2009, although trends in drug supply and demand have been unequal across regions and countries and across drug types. Member States that are party to the three international drug control Conventions, which were adopted to protect the health and welfare of mankind, remain committed to the drug control system. Evidence shows that while the system may not have eliminated the drug problem, it continues to ensure that it does not escalate to unmanageable proportions.

We have to admit that, globally, the demand for drugs has not been substantially reduced and that some challenges exist in the implementation of the drug control system, in the violence generated by trafficking in illicit drugs, in the fast evolving nature of new psychoactive substances, and in those national legislative measures which may result in a violation of human rights. The real issue is not to amend the Conventions, but to implement them according to their underlying spirit.

While intensified competition in trafficking in cocaine has led to growing levels of violence in Central America, the problem will not be resolved if drugs are legalized. Organized crime is highly adaptive. It will simply move to other businesses that are equally profitable and violent.

Countering the drug problem in full compliance with human rights standards requires an emphasis on the underlying spirit of the existing drug Conventions, which is about health. Advocacy for a stronger health perspective and an interconnected re-balancing of drug control efforts must take place. As experience has shown, neither supply reduction nor demand reduction on their own are able to solve the problem. For this reason, a more balanced approach in dealing with the drug problem is a necessity. This includes more serious efforts on prevention and treatment, not only in terms of political statements, but also in terms of funds dedicated for these purposes.

This year's World Drug Report shows the extent of the problem associated with new psychoactive substances and the deadly impact they can have on their users. The issue of new psychoactive substances is one that the international community will review at the high-level session of the Commission on Narcotic Drugs in 2014. As is the case with traditional drugs, international action against these substances must focus on addressing both supply and demand. The paucity of knowledge on the adverse impacts and risks to public health and safety, coupled with the fact that new psychoactive substances are not under international control, underscores the importance of innovative prevention measures and sharing of good practices between countries.

The multitude of new psychoactive substances and the speed with which they have emerged in all regions of the world is one of the most notable trends in drug markets over the past five years. While the existing international control system is equipped to deal with the emergence of new substances that pose a threat to public health, it is currently required to provide a response commensurate with the unprecedented fast evolving nature of the phenomenon of new psychoactive substances. Some countries have adopted innovative approaches to curb the rise of these substances, but the global nature of the problem requires a response based on international cooperation and universal coverage. Such a response should make use of all the relevant provisions of the existing international drug Conventions. In addition, in strengthening the international control system, a systematic evaluation of the appropriateness of some of the innovative approaches at the national level should be encouraged.

The detection and identification of emerging substances is a fundamental step in assessing the potential health risks of new psychoactive substances and, as such, scientific, epidemiological, forensic and toxicological information on these substances needs to be collected, updated and disseminated. As requested by the Commission on Narcotic Drugs in its resolution 56/4 on enhancing international cooperation in the identification and reporting of new psychoactive substances, the United Nations Office on Drugs and Crime (UNODC) is ready to assist the international community by building a global early warning mechanism that will provide Governments with the necessary information on new psychoactive substances, particularly scientific data that are essential in the development and implementation of evidence-based responses.

As we approach 2014 and the withdrawal of international forces from Afghanistan, that country requires concerted efforts on the part of the international community. The United Nations, and particularly UNODC, will need to provide far greater assistance to bring counter-narcotic programmes into the mainstream of social and economic development strategies so as to successfully curb the current cultivation and production of opium and the worrying

high use of opiates among the Afghan population. UNODC is working to achieve this through its country programme, one of its largest in the world, as well as its integrated regional programme for Afghanistan and neighbouring countries.

The trends in new emerging routes for trafficking of drugs and in the production of illicit substances indicate that the continent of Africa is increasingly becoming vulnerable to the drug trade and organized crime, although data from the African region is scarce. While this may further fuel political and economic instability in many countries in the region, it can also lead to an increase in the local availability and consumption of illicit substances. This, therefore, requires the international community to invest in evidence-informed interventions for the prevention of drug use, the treatment of drug dependence, the successful interdiction of illicit substances and the suppression of organized crime. The international community also needs to make the necessary resources available to monitor the drug situation in Africa.

Regarding people who inject drugs and who live with HIV, the *World Drug Report 2013* shows that there have been some improvements. Those countries which implemented a comprehensive set of HIV interventions were able to achieve a reduction in high-risk behaviours and in the transmission of HIV and other blood-borne infections. This holds the promise that countries can achieve the targets set out in the 2009 Political Declaration and Plan of Action by implementing and expanding prevention and treatment services for people who inject drugs. However, there is still an immense task ahead to achieve the commitment made by the General Assembly in the 2011 Political Declaration on HIV and AIDS: Intensifying Our Efforts to Eliminate HIV and AIDS, which sets out the target of reducing new HIV infections by 50 per cent among people who inject drugs. This warrants significant scaling up of evidence-based HIV interventions in countries where the epidemic is driven by injecting drug use.

Illicit drugs continue to jeopardize the health and welfare of people throughout the world. They represent a clear threat to the stability and security of entire regions and to economic and social development. In so many ways, illicit drugs, crime and development are bound to each other. Drug dependence is often exacerbated by low social and economic development, and drug trafficking, along with many other forms of transnational organized crime, undermines human development. We must break this destructive cycle in order to protect the right of people to a healthy way of life and to promote sustainable economic growth and greater security and stability. It is, therefore, important that drugs are addressed when developing the post-2015 development agenda.

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EXPLANATORY NOTES

The boundaries and names shown and the designations used on maps do not imply official endorsement or acceptance by the United Nations. A dotted line represents approximately the line of control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. Disputed boundaries (China/India) are represented by cross hatch due to the difficulty of showing sufficient detail.

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Countries and areas are referred to by the names that were in official use at the time the relevant data were collected.

All references to Kosovo in the present publication should be understood to be in compliance with Security Council resolution 1244 (1999).

Since there is some scientific and legal ambiguity about the distinctions between "drug use", "drug misuse" and "drug abuse", the neutral terms "drug use" and "drug consumption" are used in this report.

The data on population used in this report are from: United Nations, Department of Economic and Social Affairs, Population Division, *World Population Prospects: The 2010 Revision*. Available from http://esa.un.org/wpp.

References to dollars ($) are to United States dollars, unless otherwise stated.

References to "tons" are to metric tons, unless otherwise stated.

The following abbreviations have been used in this Report:

AIDS	acquired immunodeficiency syndrome
ATS	amphetamine-type stimulant
BZP	N-benzylpiperazine
CICAD	Inter-American Drug Abuse Control Commission (Organization of American States)
*m*CPP	*m*-chlorophenylpiperazine
DEA	Drug Enforcement Administration (United States of America)
EMCDDA	European Monitoring Centre for Drugs and Drug Addiction
Europol	European Police Office
GDP	gross domestic product
ha	hectare
HIV	human immunodeficiency virus
INTERPOL	International Criminal Police Organization
LSD	lysergic acid diethylamide
MDA	methylenedioxyamphetamine
MDE	methylenedioxyethylamphetamine
MDMA	methylenedioxymethamphetamine
3,4-MDP-2-P	3,4-methylenedioxyphenyl-2-propanone
MDPV	methylenedioxypyrovalerone
4-MMC	4-methylmethcathinone
NPS	new psychoactive substance
P-2-P	1-phenyl-2-propanone
PMK	piperonyl methyl ketone
THC	tetrahydrocannabinol
WHO	World Health Organization

EXECUTIVE SUMMARY

The World Drug Report presents a comprehensive overview of the latest developments in drug markets. It covers production, trafficking, consumption and related health consequences. Chapter 1 of this year's report examines the global situation and the latest trends in the different drug markets and the extent of illicit drug use, as well as the related health impact.

Chapter 2 addresses the phenomenon of new psychoactive substances (NPS), which can have deadly consequences for their users but are hard to control, with dynamic, fast-mutating producers and "product lines" which have emerged over the past decade.

The global picture

Global drug use situation remains stable

On the whole, the global drug use situation has remained stable. While there has been some increase in the estimated total number of users of any illicit substance, estimates show that the number of drug users with dependence or drug use disorders has remained stable. The increase in the annually estimated number of users is, to a large extent, a reflection of an increase in the world population.

However, polydrug use, especially the combination of prescription drugs and illicit substances, continues to be a concern. The misuse of sedatives and tranquillizers is of particular concern, with more than 60 per cent of the countries covered in the report ranking such substances as among the first three misused types of substances.

The increasing number of NPS appearing on the market has also become a major public health concern, not only because of increasing use but also because of the lack of scientific research and understanding of their adverse effects.

Injecting drug use and HIV remain a public health concern

New data reveal that the prevalence of people who inject drugs and those who inject drugs and are also living with HIV in 2011 was lower than previously estimated: 14.0 million people between the ages of 15 and 64 are estimated to be injecting drugs, while 1.6 million people who inject drugs are living with HIV. This reflects a 12 per cent decline in the number of people who inject drugs and a 46 per cent decline in the number of people who inject drugs that are living with HIV since the 2008 estimates.

In 2011, the number of drug-related deaths was estimated at 211,000. Most of those deaths were among the younger population of users and were, to a large extent, preventable. Opioids remained the most commonly reported group of substances involved in drug-related deaths. There continues to be a major gap in the delivery of treatment services for drug dependence: only an estimated one in six problem drug users had received treatment in the preceding year.

Maritime trafficking poses challenge to authorities

Given the large quantities of licit substances that make their way across oceans and continents every day, in containers and even small boats, maritime trafficking poses a particularly knotty challenge for the authorities.

East and West Africa seem to be gaining in prominence with regard to routes for maritime trafficking. A new maritime route going southwards from Afghanistan via ports in the Islamic Republic of Iran or Pakistan is increasingly being used by traffickers to reach consumer markets through East and West African ports. Since 2009, seizures of heroin have risen sharply in Africa, especially in East Africa, where they increased almost 10-fold.

Experience has shown that a maritime seizure is consistently more likely to be larger than a seizure involving transport by road or rail. In fact, although maritime seizures constitute no more than 11 per cent of all cases across all drug categories globally, each maritime seizure was on average almost 30 times larger than seized consignments trafficked by air. Targeted interdiction efforts by the authorities would enable them to seize larger quantities of drugs being trafficked over water.

New drug trafficking routes

Traffickers are increasingly looking for new routes to supplement the old ones: new land routes for heroin smuggling seem to be emerging, e.g. in addition to the established Balkan and northern routes, heroin is trafficked southward from Afghanistan via the Islamic Republic of Iran or Pakistan, leading through the Middle East via Iraq. While the Balkan trafficking route remains the most popular one, a decrease in the amount of heroin being trafficked on this route has been noted.

Moreover, Afghan opiates seem to be emerging as competition to opiates produced and consumed in the East and South-East Asia subregion, as seizures made in countries of that region show.

While it is clear that the African continent is becoming increasingly important and vulnerable in terms of the proliferation of trafficking routes, the availability of data is very limited. In order to effectively monitor this worrying trend, there is an urgent need to improve the data collection and analysis capacity of countries in the region.

Cocaine seizures in Colombia indicate that the Atlantic route may be gaining in prominence as compared with the Pacific route in maritime trafficking; linguistic ties appear to play a role in cocaine trafficking from South America

to Europe via Brazil, Portugal and lusophone countries in Africa. The cocaine market seems to be expanding towards the emerging economies in Asia.

Overall trends across drug categories

Opiates

Trends with regard to the production and consumption of opiates witnessed some major shifts.

The limited available data suggest that opioid use (prescription opioids, heroin and opium) has gone up in parts of Asia (East and South-East Asia, as well as Central and West Asia) and Africa since 2009.

Use of opiates (heroin and opium), on the other hand, remains stable (around 16.5 million people, or 0.4 per cent of the population aged 15-64), although a high prevalence for opiate use has been reported from South-West and Central Asia, Eastern and South-Eastern Europe and North America.

In Europe specifically, there are indications that heroin use is declining, due to a number of factors, including an aging user population in treatment and increased interdiction of supply. Nevertheless, non-medical use of prescription opioids continues to be reported from some parts of Europe.

Production-wise, Afghanistan retained its position as the lead producer and cultivator of opium globally (74 per cent of global illicit opium production in 2012). While the global area under poppy cultivation rose by 15 per cent in 2012, driven largely by increases in Afghanistan and Myanmar, global opium production fell by almost 30 per cent, to less than 5,000 tons in 2012, mainly as a result of poor yields in Afghanistan. Mexico remained the largest producer of opium in the Americas.

It appears that opium production in the Lao People's Democratic Republic and Myanmar may not be able to meet the demand posed by the increasing number of heroin users in some parts of Asia.

While seizures of morphine and heroin increased globally in 2011, declines were noted in specific regions and countries, including Turkey and Western and Central Europe.

Cocaine

The global area under coca cultivation amounted to 155,600 ha in 2011, almost unchanged from a year earlier but 14 per cent lower than in 2007 and 30 per cent less than in 2000. Estimates of the amounts of cocaine manufactured, expressed in quantities of 100 per cent pure cocaine, ranged from 776 to 1,051 tons in 2011, largely unchanged from a year earlier. The world's largest cocaine seizures (not adjusted for purity) continue to be reported from Colombia (200 tons) and the United States (94 tons). However, there has been an indication in recent years that the cocaine market has been shifting to several regions which have not been associated previously with either trafficking or use. Significant increases have been noted in Asia, Oceania and Central and South America and the Caribbean. In Central America, intensified competition in trafficking of cocaine has led to growing levels of violence.

Cocaine has long been perceived as a drug for the affluent. There is some evidence which, though inconclusive, suggests that this perception may not be entirely groundless, all other factors being equal. Nonetheless, the extent of its use is not always led by the wallet. There are examples of wealthy countries with low prevalence rates, and vice-versa.

Arguably, parts of East and South-East Asia run a higher risk of expansion of cocaine use (although from very low levels). Seizures in Hong Kong, China, rose dramatically, to almost 600 kg in 2010, and had exceeded 800 kg by 2011. This can be attributed to several factors, often linked to the glamour associated with its use and the emergence of more affluent sections of society. In the case of Latin America, in contrast, most of the increase appears to be linked to "spill-over" effects, as cocaine is widely available and relatively cheap owing to the proximity to producing countries.

In North America, seizures and prevalence have declined considerably since 2006 (with the exception of a rebound in seizures in 2011). Between 2006 and 2011, cocaine use among the general population in the United States fell by 40 per cent, which is partly linked to less production in Colombia, law enforcement intervention and inter-cartel violence.

While, earlier, North America and Central/Western Europe dominated the cocaine market, today they account for approximately one half of users globally, a reflection of the fact that use seems to have stabilized in Europe and declined in North America.

In Oceania, on the other hand, cocaine seizures reached new highs in 2010 and 2011 (1.9 and 1.8 tons, respectively, up from 290 kg in 2009). The annual prevalence rate for cocaine use in Australia for the population aged 14 years or older more than doubled from 1.0 per cent in 2004 to 2.1 per cent of the adult population in 2010; that figure is higher than the European average and exceeds the corresponding prevalence rates in the United States.

Amphetamine-type stimulants

There are signs that the market for amphetamine-type stimulants (ATS) is expanding: seizures and consumption levels are increasing, manufacture seems to be spreading and new markets are developing.

The use of ATS, excluding "ecstasy", remains widespread globally, and appears to be increasing in most regions. In 2011, an estimated 0.7 per cent of the global population aged 15-64, or 33.8 million people, had used ATS in the preceding year. The prevalence of "ecstasy" in 2011 (19.4 million, or 0.4 per cent of the population) was lower than in 2009.

While use is steady in the traditional markets of North America and Oceania, there seems to be an increase in the market in Asia's developed economies, notably in East and South-East Asia, and there is also an emerging market in Africa, an assessment that is borne out by increasing diversions of precursors, seizures and methamphetamine manufacture. The estimated annual prevalence of ATS use in the region is higher than the global average.

At the global level, seizures have risen to a new high: 123 tons in 2011, a 66 per cent rise compared with 2010 (74 tons) and a doubling since 2005 (60 tons). Mexico clocked the largest amount of methamphetamine seized, more than doubling, from 13 tons to 31 tons, within the space of a year, thus surpassing the United States for the first time.

Methamphetamine continues to be the mainstay of the ATS business; it accounted for 71 per cent of global ATS seizures in 2011. Methamphetamine pills remain the predominant ATS in East and South-East Asia where 122.8 million pills were seized in 2011, although this was a 9 per cent decline compared with 2010 (134.4 million pills). Seizures of crystalline methamphetamine, however, increased to 8.8 tons, the highest level during the past five years, indicating that the substance is an imminent threat.

Methamphetamine manufacture seems to be spreading as well: new locations were uncovered, inter alia, in Poland and the Russian Federation. There is also an indication of increased manufacturing activity in Central America and an increase in the influence of Mexican drug trafficking organizations in the synthetic drugs market within the region.

Figures for amphetamine seizures have also gone up, particularly in the Middle East, where the drug is available largely in pill form, marketed as "captagon" pills and consisting largely of amphetamine.

Europe and the United States reported almost the same number of amphetamine laboratories (58 versus 57) in 2011, with the total number remaining fairly stable compared with 2010.

While "ecstasy" use has been declining globally, it seems to be increasing in Europe. In ascending order, Europe, North America and Oceania remain the three regions with a prevalence of "ecstasy" use that is above the global average.

Cannabis

Providing a global picture of levels of cannabis cultivation and production remains a difficult task: although cannabis is produced in practically every country in the world, its cultivation is largely localized and, more often than not, feeds local markets.

Cannabis remains the most widely used illicit substance. There was a minor increase in the prevalence of cannabis users (180.6 million or 3.9 per cent of the population aged 15-64) as compared with previous estimates in 2009.

The areas of cannabis eradicated increased in the United States, possibly indicating an increase in the area under cultivation. Cultivation also seems to have gone up in the Americas as a whole. In South America, reported cannabis herb seizures rose by 46 per cent in 2011.

In Europe, seizures of cannabis herb increased, while seizures of cannabis resin ("hashish") went down. This may indicate that domestically produced cannabis continues to replace imported resin, mainly from Morocco. The production of cannabis resin seems to have stabilized and even declined in its main producing countries, i.e. Afghanistan and Morocco.

Many countries in Africa reported seizures of cannabis herb, with Nigeria reporting the largest quantities seized in the region.

In Europe, cannabis is generally cultivated outdoors in countries with favourable climatic conditions. In countries with less favourable climatic conditions, such as Belgium and the Netherlands, a larger number of indoor plants are found. It is difficult to compile an accurate picture of cultivation and eradication, as this varies widely across countries and climatic zones. Plant density fluctuates wildly, depending on the cultivation method (indoor or outdoor) and environmental factors.

New psychoactive substances

While new harmful substances have been emerging with unfailing regularity on the drug scene, the international drug control system is floundering, for the first time, under the speed and creativity of the phenomenon known as new psychoactive substances (NPS).

The number of NPS reported by Member States to UNODC rose from 166 at the end of 2009 to 251 by mid-2012, an increase of more than 50 per cent. For the first time, the number of NPS actually exceeded the total number of substances under international control (234).

NPS are substances of abuse, either in a pure form or a preparation, that are not controlled by international drug conventions, but which may pose a public health threat. In this context, the term "new" does not necessarily refer to new inventions but to substances that have newly become available in specific markets. In general, NPS is an umbrella term for unregulated (new) psychoactive substances or products intended to mimic the effects of controlled drugs.

Member States have responded to this challenge using a variety of methods within their legislative frameworks, by attempting to put single substances or their analogues under control.

It has generally been observed that, when a NPS is controlled or scheduled, its use declines shortly thereafter, which has a positive impact on health-related consequences and deaths related to the substance, although the "substi-

tution effect" has inhibited any in-depth research on the long-term impact of NPS scheduling. There are of course, instances when scheduling or controlling a NPS has had little or no impact. Generally, the following kinds of impacts have been observed after the scheduling of a NPS:

(a) The substance remains on the market, but its use declines immediately. Examples include mephedrone in the United Kingdom of Great Britain and Northern Ireland, BZP in New Zealand, "legal highs" in Poland, mephedrone in Australia and MDPV in the United States of America;

(b) Use of the substance declines after a longer interval, maybe a year or more (e.g. ketamine in the United States);

(c) Scheduling has little or no immediate impact on the use of the substance, e.g. 3,4-methylenedioxy-*N*-methylamphetamine (MDMA), commonly known as "ecstasy", in the United States and other countries.

Further, there are cases of NPS disappearing from the market. This has also been the case with the majority of the substances controlled under the 1961 Convention and the 1971 Convention. Of the 234 substances currently under international control, only a few dozen are still being misused, and the bulk of the misuse is concentrated in a dozen such substances.

It is obvious that legislations to control NPS are not a "one size fits all" solution, and there are always exceptions to the rule. However, a holistic approach which involves a number of factors — prevention and treatment, legal status, improving precursor controls and cracking down on trafficking rings — has to be applied to tackle the situation.

There is a lack of long-term data which would provide a much-needed perspective: no sooner is one substance scheduled, than another one replaces it, thus making it difficult to study the long-term impact of a substance on usage and its health effects.

The problem of NPS is a hydra-headed one in that manufacturers produce new variants to escape the new legal frameworks that are constantly being developed to control known substances. These substances include synthetic and plant-based psychoactive substances, and have rapidly spread in widely dispersed markets. Until mid-2012, the majority of the identified NPS were synthetic cannabinoids (23 per cent), phenethylamines (23 per cent) and synthetic cathinones (18 per cent), followed by tryptamines (10 per cent), plant-based substances (8 per cent) and piperazines (5 per cent). The single most widespread substances were JWH-018 and JWH-073 among the synthetic cannabinoids; mephedrone, MDPV and methylone among the synthetic cathinones; and *m*-chlorophenylpiperazine (*m*CPP), *N*-benzylpiperazine (BZP) and 1-(3-trifluoromethylphenyl)piperazine (TFMPP) among the piperazines. Plant-based substances included mostly kratom, khat and *Salvia divinorum*.

What makes NPS especially dangerous and problematic is the general perception surrounding them. They have often been marketed as "legal highs", implying that they are safe to consume and use, while the truth may be quite different. In order to mislead the authorities, suppliers have also marketed and advertised their products aggressively and sold them under the names of relatively harmless everyday products such as room fresheners, bath salts, herbal incenses and even plant fertilizers.

Countries in nearly all regions have reported the emergence of NPS. The 2008-2012 period in particular saw the emergence of synthetic cannabinoids and synthetic cathinones, while the number of countries reporting new phenethylamines, ketamine and piperazines declined (as compared with the period prior to 2008).

Origin and manufacture

While most widespread in Europe and North America, NPS seem to originate nowadays primarily in Asia (East and South Asia), notably in countries known for their advanced chemical and pharmaceutical industries. Domestic manufacture has also been reported by countries in Europe, the Americas and Asia. Nonetheless, the overall pattern is one of transregional trafficking which deviates from the clandestine manufacture of controlled psychotropic substances such as ATS, which typically occurs within the same region as where the consumers are located.

Role of technology

The Internet seems to play an important role in the business of NPS: 88 per cent of countries responding to a UNODC survey said that the Internet served as a key source for the supply in their markets. At the same time, a Eurobarometer survey found that just 7 per cent of young consumers of NPS in Europe (age 15-24) used the Internet to actually purchase such substances, indicating that, while the import and wholesale business in such substances may be increasingly conducted via the Internet, the end consumer still retains a preference for more traditional retail and distribution channels.

Spread of new psychoactive substances at the regional level

With its early warning system, comprising 27 European Union countries and Croatia, Norway and Turkey, Europe has the most advanced regional system in place to deal with emerging NPS. Through the early warning system, formal notification was provided for a total of 236 new substances during the 2005-2012 period, equivalent to more than 90 per cent of all substances found globally and reported to UNODC (251). The number of identified NPS in the European Union rose from 14 in 2005 to 236 by the end of 2012.

NPS seem to constitute a significant market segment already. Close to 5 per cent of people aged 15-24 have already experimented with NPS in the European Union,

which is equivalent to one-fifth of the numbers who have tried cannabis and close to around half of the number who have used drugs other than cannabis. While cannabis use has clearly declined among adolescents and young people in Europe over the past decade, and the use of drugs other than cannabis has remained largely stable, the use of NPS has gone up.

Within Europe, Eurobarometer data for 2011 suggest that five countries account for almost three-quarters of all users of NPS: United Kingdom (23 per cent of the European Union total), followed by Poland (17 per cent), France (14 per cent), Germany (12 per cent) and Spain (8 per cent). The United Kingdom is also the country that identified the most NPS in the European Union (30 per cent of the total during the 2005-2010 period).

The United States identified the largest number of NPS worldwide: for 2012 as a whole, a total of 158 NPS were identified, i.e. twice as many as in the European Union (73). The most frequently reported substances were synthetic cannabinoids (51 in 2012, up from 2 in 2009) and synthetic cathinones (31 in 2012, up from 4 in 2009). Both have a serious negative impact on health. Excluding cannabis, use of NPS among students is more widespread than the use of any other drug, owing primarily to synthetic cannabinoids as contained in Spice or similar herbal mixtures. Use of NPS among youth in the United States appears to be more than twice as widespread as in the European Union.

In Canada, authorities identified 59 NPS over the first two quarters of 2012, i.e. almost as many as in the United States. Most of the substances were synthetic cathinones (18), synthetic cannabinoids (16) and phenethylamines (11). In a national school survey, widespread use was reported among tenth-grade students for *Salvia divinorum* (lifetime prevalence of 5.8 per cent), jimson weed or *Datura* (2.6 per cent), a hallucinogenic plant, and ketamine (1.6 per cent).

NPS are also making inroads in the countries of Latin America, even though, generally speaking, levels of misuse of such substances in the region are lower than in North America or Europe. Reported substances included ketamine and plant-based substances, notably *Salvia divinorum*, followed by piperazines, synthetic cathinones, phenethylamines and, to a lesser extent, synthetic cannabinoids. Brazil also reported the emergence of mephedrone and of DMMA (a phenethylamine) in its market; Chile reported the emergence of *Salvia divinorum* and tryptamine; Costa Rica reported the emergence of BZP and TFMPP, two piperazines.

For many years, New Zealand has played a key role in the market for piperazines, notably BZP. A large number of NPS are also found in Australia, similar to the situation in Europe and North America. Overall, 44 NPS were identified during the first two quarters of 2012 in the Oceania region, equivalent to one quarter of all such substances identified worldwide. Australia identified 33 NPS during the first two quarters of 2012, led by synthetic cathinones (13) and phenethylamines (8).

According to the UNODC survey undertaken in 2012, the second-largest number of countries reporting the emergence of NPS was in Asia. The emergence of such substances was reported from a number of countries and areas, mostly in East and South-East Asia (Brunei Darussalam; China; Hong Kong, China; Indonesia; Japan; Philippines; Singapore; Thailand; Viet Nam), as well as in the Middle East (Bahrain, Israel, Jordan, Oman, Saudi Arabia and United Arab Emirates).

Hong Kong, China, reported the emergence of a number of synthetic cannabinoids (such as JWH-018) and synthetic cathinones (4-methylethcathinone and butylone). Indonesia informed UNODC of the emergence of BZP. Singapore saw the emergence of a number of synthetic cannabinoids (including JWH-018) and synthetic cathinones (3-fluromethcathinone and 4-methylecathinone). Oman witnessed the emergence of synthetic cannabinoids (JWH-018). Japan reported the emergence of phenethylamines, synthetic cathinones, piperazines, ketamine, synthetic cannabinoids and plant-based substances.

The two main NPS in Asia in terms of consumption are ketamine and kratom, mostly affecting the countries of East and South-East Asia. Ketamine pills have been sold for several years as a substitute for "ecstasy" (and sometimes even as "ecstasy"). In addition, large-scale traditional consumption of khat is present in Western Asia, notably in Yemen.

In total, 7 African countries (Angola, Cape Verde, Egypt, Ghana, South Africa, Togo and Zimbabwe) reported the emergence of NPS to UNODC. Egypt reported not only the emergence of plant-based substances (*Salvia divinorum*) but also the emergence of synthetic cannabinoids, ketamine, piperazines (BZP) and other substances (2-diphenylmethylpiperidine (2-DPMP) and 4-benzylpiperidine). Nonetheless, the overall problems related to the production and consumption of NPS appear to be less pronounced in Africa. There are, however, a number of traditionally used substances (such as khat or ibogaine) that fall under the category of NPS and that, in terms of their spread, may cause serious health problems and other social consequences.

The road ahead

Scheduling or controlling a substance is a lengthy — and costly — process, especially as it is the authorities who bear the onus of proof. Additionally, controlling an ever-larger number of substances, affecting police, customs, forensic laboratories, import/export authorities and the health authorities, among others, may stretch some Member States beyond their capacities.

Alternative systems, such as the establishment of "early warning systems" for NPS, "emergency scheduling", "ana-

logue scheduling", "generic scheduling", application of the "medicines law" and other creative approaches, all have their pros and cons. Most have improved the situation and have taught valuable lessons in planning for future control regimes. However, what is missing is coordination at the global level so that drug dealers cannot simply exploit loopholes, both within regions and even within countries.

The establishment of a global early warning system is needed to inform Member States of emerging substances and to support them in their response to this complex and changing phenomenon.[1] While the international drug control conventions offer the possibility of scheduling new substances, the sheer rapidity of emerging NPS makes this a very challenging undertaking. What is needed is an understanding and sharing of methods and lessons learned in regional responses to the situation involving NPS before exploring the setting up of a global response to the problem.

1 In its resolution 56/4 of 15 March 2013, the Commission on Narcotic Drugs encouraged the United Nations Office on Drugs and Crime "to share and exchange ideas, efforts, good practices and experiences in adopting effective responses to address the unique challenges posed by new psychoactive substances, which may include, among other national responses, new laws, regulations and restrictions".

1 RECENT STATISTICS AND TREND ANALYSIS OF ILLICIT DRUG MARKETS

A. EXTENT OF ILLICIT DRUG USE AND HEALTH CONSEQUENCES

Extent of drug use

In 2011, between 167 and 315 million people aged 15–64 were estimated to have used an illicit substance in the preceding year. This corresponds to between 3.6 and 6.9 per cent of the adult population. The prevalence of illicit drug use and the numbers of problem drug users — those with drug use disorders or dependence – have remained stable.[1] Since 2009, the prevalence of cannabis, opioids, and opiates use has gone up, while the prevalence of use of cocaine, amphetamine-type stimulants and "ecstasy"-group substances appears to have followed a declining trend between 2009 and 2011.[2] Nevertheless, since 2008 there has been an overall 18 per cent increase in the estimated total number of people who had used an illicit substance in the preceding year, which to some extent reflects both an increase in the global population and a slight increase in the prevalence of illicit drug use. A series of maps are presented in Annex I showing the prevalence of drug use among the population aged 15-64 for cannabis, amphetamies, opioids, opiates, cocaine and ecstasy. In addition, a table is included providing estimates of the prevalence and total number of users for each drug type at the global, regional and subregional levels.

Cannabis

Cannabis use has increased globally, particularly in Asia since 2009. Although epidemiological data is not available, experts from the region report a perceived increase in use. The regions with a prevalence of cannabis use that is higher than the global average continue to be West and Central Africa (12.4 per cent), Oceania (essentially Australia and New Zealand, 10.9 per cent), North America (10.7 per cent) and Western and Central Europe (7.6 per cent). Cannabis use in North America and in most parts of Western and Central Europe is considered to be stable or declining.

Fig. 2. Trends in the prevalence of different drugs, 2009-2011

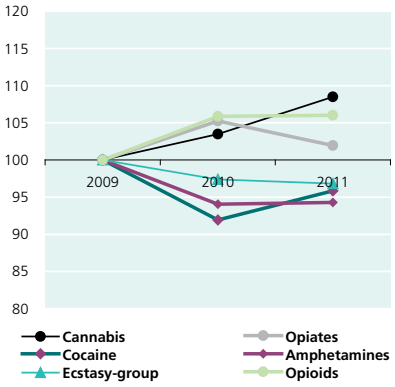
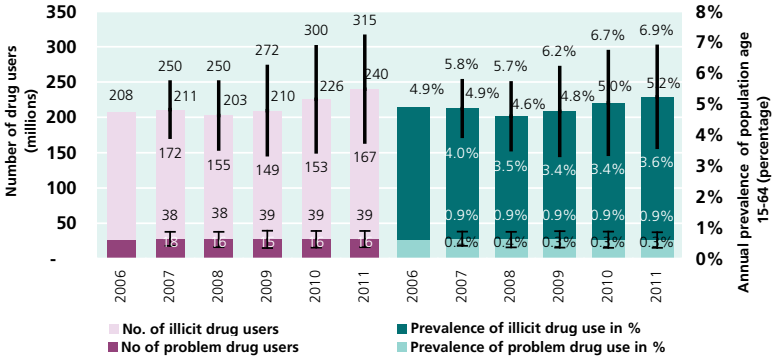


Fig. 1. Trends in drug use, 2006-2011



1 The number of problem drug users is driven mainly by the estimated number of cocaine and opiate users and therefore reflects the overall stable trends in the use of those drugs.

2 Changes in the prevalence of different drugs may be an artefact owing to revised estimates within regions and subregions that may impact the global prevalence of the drugs.

Amphetamine-type stimulants

Use of ATS, excluding "ecstasy", remains widespread globally, and appears to be increasing. Although prevalence estimates are not available from Asia and Africa, experts from these regions continue to report a perceived increase in the use of ATS. While the use of ATS was already a problem in East and South-East Asia, there are reports of increasing diversion of precursor chemicals, as well as increased seizures and manufacture of methamphetamine, combined with an increase in its use. Current data from the drug use survey in Pakistan, for instance supports this assessment. Use of ATS is emerging in Pakistan, with a reported annual prevalence of 0.1 per cent among the general population.[3] High levels of ATS use are reported in Oceania (2.1 per cent in Australia and New Zealand), Central and North America (1.3 per cent each) and Africa (0.9 per cent), while the estimated annual prevalence of ATS use in Asia (0.7 per cent) is comparable with the global average.

Opioids

The use of opioids (heroin, opium and prescription opioids) has increased in Asia since 2009, particularly in East, South-East, Central and South-West Asia. While reliable data do not exist for most parts of Africa, experts report an increase in the use of opioids there. North America 3.9 per cent), Oceania (3.0 per cent), the Near and Middle East/South-West Asia (1.9 per cent) and East and South-Eastern Europe (1.2 per cent) show a prevalence of opioid use that is higher than the global average. The use of opiates (heroin and opium) has remained stable in some regions, nevertheless, a high prevalence is reported in the Near and Middle East/South-West Asia (1.2 per cent), primarily in Afghanistan, Iran (Islamic Republic of) and Pakistan, as well as Central Asia (0.8 per cent), Eastern and South-Eastern Europe (0.8 per cent), North America (0.5 per cent) and West and Central Africa (0.4 per cent).

Cocaine

The two major markets for cocaine, North America and Western and Central Europe, registered a decrease in cocaine use between 2010 and 2011, with annual prevalence among the adult population in Western and Central Europe decreasing from 1.3 per cent in 2010 to 1.2 per cent in 2011, and from 1.6 per cent to 1.5 per cent in North America. While cocaine use in many South American countries has decreased or remained stable, there has been a substantial increase in Brazil that is obvious enough to be reflected in the regional prevalence rate for 2011. Australia has also reported an increase in cocaine use.

"Ecstasy"

Overall, use of "ecstasy" (i.e., methylenedioxymethamphetamine (MDMA)) has been declining, although it seems to be increasing in Europe. The three regions with a high prevalence of "ecstasy" use continue to be Oceania (2.9 per cent), North America (0.9 per cent) and Europe (0.7 per cent). Use continues to be associated with young people and recreational and nightlife settings in urban centres. For example, of the 2 million past-year users of "ecstasy" in Europe, 1.5 million were between 15 and 34 years of age.[4]

Non-medical use of prescription drugs

While global estimates of non-medical use of prescription drugs are not available, such use remains a major public health concern. The misuse or non-medical use of tranquillizers and sedatives such as benzodiazepines and barbiturates remains high and, at times, higher than that of many illicit substances. Along with the single use of tranquillizers (e.g. benzodiazepines), their use is commonly observed among polydrug users, especially among users of heroin who use benzodiazepines to enhance its effects, as well as those on methadone medication.[5] Benzodiazepines are also often cited among the other substances reported in both fatal and non-fatal overdose cases among opioid users.[6]

The misuse of tranquillizers and sedatives is spread across all regions. Among the 103 countries that have provided information on the non-medical use of such substances through the annual report questionnaire, nearly 60 per cent ranked them as among the three most misused types of substances in their country, while nearly 15 per cent of countries[7] ranked them as the most commonly used substances. In countries with data on the annual prevalence of tranquillizers, prevalence varied between 0.4 per cent in England and Wales and 12.9 per cent in Estonia.

The misuse of prescription opioids is also increasingly being reported from different regions. Tramadol is an opioid painkiller that is not under international control, whose misuse is being reported from many countries in Africa, the Middle East, Asia (including China) and the

3 United Nations Office on Drugs and Crime and Pakistan, Ministry of Narcotics Control, "*Drug use in Pakistan 2013: technical summary report*" (March 2013).

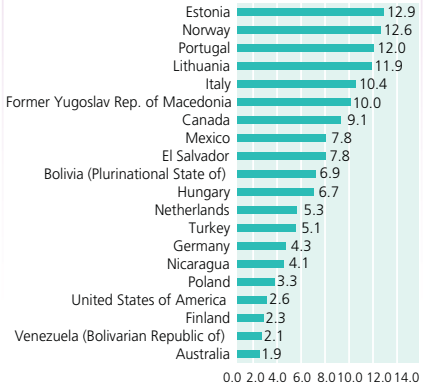
4 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe* (Luxembourg, Publications Office of the European Union, 2012).

5 M. Backmund and others, "Co-consumption of benzodiazepines in heroin users, methadone- substituted and codeine-substituted patients", *Journal of Addictive Diseases*, vol. 24, No. 4 (2006), pp. 17-29.

6 P. Oliver, R. Forrest and J. Keen, "Benzodiazepines and cocaine as risk factors in fatal opioid overdoses" (London, National Treatment Agency for Substance Misuse, April 2007.

7 Algeria, Bulgaria, Burkina Faso, Estonia, Honduras, Hungary, Italy, Netherlands, Nicaragua, Peru, Poland, Romania, Serbia and Venezuela (Bolivarian Republic of).

Fig. 3. Annual prevalence of non medical use of tranquillizers and sedatives among the general population in high-prevalence countries



Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire (2007-2011).

Pacific Islands. In many countries, the most common sources of prescription drugs are friends and relatives who have been prescribed them by a physician.[8] The sale of counterfeit prescription drugs through black markets and loosely controlled pharmacies in developing countries is quite common, while unregulated Internet pharmacies are fast becoming a common source.[9]

New psychoactive substances

NPS have become a major concern, not only because of their increasing use but also because of the lack of scientific research and understanding of their adverse effects (see chapter 2).

Apart from these new substances, several countries[10] have also reported the misuse of cough medicines containing codeine and simple cough suppressants such as dextromethorphan. Dextromethorphan was included for pre-review by the Expert Committee on Drug Dependence at its thirty-fifth meeting, in 2012.[11] The misuse of dextromethorphan is quite common among adolescents and young adults. For instance, in the United States of America, the annual prevalence of non-medical use of cough syrups among students in eighth, tenth and twelfth grades was reported as 2.7 per cent, 5.5 per cent and 5.3 per cent, respectively.[12] When cough syrup containing dextromethorphan is taken in quantities higher than the recommended dosages, the dextromethorphan acts as a "dissociative hallucinogen", producing effects similar to those created by other hallucinogens such as ketamine and phencyclidine.[13]

Extent of health consequences of drug use

Injecting drug use

Updating the previous global estimates, the United Nations Office on Drugs and Crime (UNODC) estimates that in 2011 a total of 14.0 million (range: 11.2 million to 22.0 million) people injected drugs worldwide, which corresponds to 0.31 per cent (range: 0.24-0.48 per cent) of the population aged 15-64.[14] The current global estimates are lower than the previous ones of 15.9 million people, and primarily reflect the fact that many countries have revised their earlier estimates downward, based on behavioural surveillance data. However, many countries have also reported an increase in the prevalence of injecting drug use and in the number of people who inject drugs.

Changes over time in national, regional and global estimates of injecting drug use may result from a number of factors, such as improvements in the methodology or coverage of behavioural surveillance (e.g., Georgia, Italy and South Africa), additional countries undertaking behavioural surveillance for the first time (Kenya and Seychelles) or changes in patterns of drug use, including injecting drug use (Australia and Brazil). Such factors have contributed to the overall reduced global estimates of people who inject drugs. Notable increases in the estimated number of people who inject drugs have been reported from Pakistan, the Russian Federation and Viet Nam, while countries reporting a considerable reduction include Brazil, Indonesia, South Africa, Thailand and the United States.

At a regional level, a high prevalence of injecting drug use is found in Eastern and South-Eastern Europe (1.3 per cent of the population aged 15-64), where the percentage of people who inject drugs is four times greater than the global average and which alone accounts for 21 per cent of the total number of people who inject drugs globally.

A high prevalence rate for injecting drug use is also noted in Central Asia (1.3 per cent), which has a rate of more

8 United Nations Office on Drugs and Crime, *The Non-medical Use of Prescription Drugs: Policy Direction Issues* (Vienna, 2011).

9 *Report of the International Narcotics Control Board for 2012* (United Nations publication, Sales No. E.13.XI.1).

10 Including Australia, Bangladesh, Canada, Germany, Indonesia, Nigeria, Pakistan, the Republic of Korea, the United States, Sweden and Hong Kong, China.

11 World Health Organization, "Dextromethorphan: pre-review report", prepared for the thirty-fifth meeting of the Expert Committee on Drug Dependence, held in Hammamet, Tunisia, from 4 to 8 June 2012.

12 Lloyd D. Johnston and others, *Monitoring the Future: National Results on Adolescent Drug Use—Overview of Key Findings, 2011* (Ann Arbor, Michigan, University of Michigan, Institute for Social Research, 2012).

13 World Health Organization, "Dextromethorphan: pre-review report".

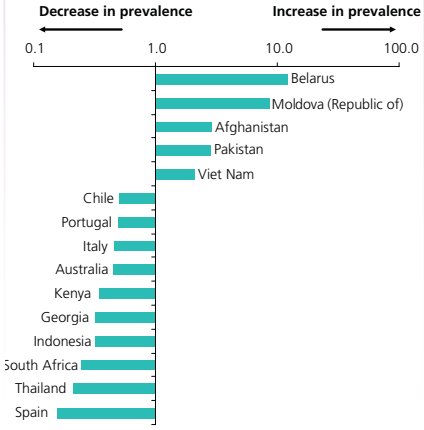
14 This estimate is based on information provided by 83 countries that together account for 81 per cent of the global population aged 15-64.

Table 1. Estimated number and prevalence of people who inject drugs among the general population aged 15-64, 2011

Region	Subregion	Injecting drug users					
		Estimated number			Prevalence (%)		
		Low	Best	High	Low	Best	High
AFRICA		304,925	997,574	6,608,038	0.05	0.17	1.12
AMERICA		2,908,787	3,427,561	4,019,041	0.47	0.55	0.64
	North America	1,935,144	2,006,470	2,101,572	0.63	0.65	0.68
	Latin America and the Caribbean	973,643	1,421,091	1,917,468	0.31	0.45	0.61
ASIA		4,328,212	5,692,005	7,031,647	0.16	0.20	0.25
	Central Asia and Transcaucasia	659,582	699,191	758,421	1.25	1.33	1.44
	East and South-East Asia	2,959,863	3,786,472	4,677,484	0.19	0.25	0.30
	Near and Middle East/ South-West Asia	462,269	952,948	1,334,013	0.17	0.36	0.50
	South Asia	246,498	253,394	261,729	0.03	0.03	0.03
EUROPE		3,553,859	3,777,948	4,156,492	0.64	0.68	0.75
	Eastern/South-Eastern Europe	2,821,599	2,907,484	2,987,155	1.23	1.26	1.30
	Western/Central Europe	732,260	870,464	1,169,337	0.23	0.27	0.36
OCEANIA		118,628	128,005	158,919	0.49	0.53	0.66
GLOBAL		**11,214,411**	**14,023,092**	**21,974,136**	**0.24**	**0.31**	**0.48**

Sources: United Nations Office on Drugs and Crime, data from the annual report questionnaire; progress reports of the Joint United Nations Programme on HIV/AIDS (UNAIDS) on the global AIDS response (various years); the Reference Group to the United Nations on HIV and Injecting Drug Use; estimates based on United Nations Office on Drugs and Crime data; and national Government reports.

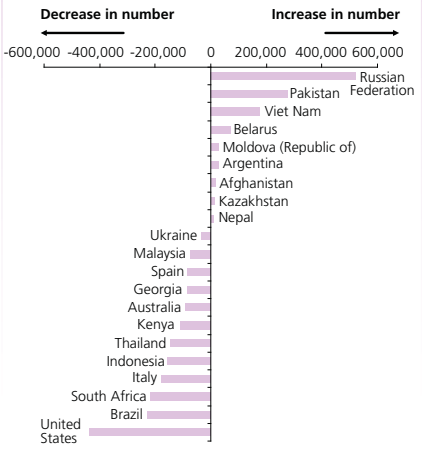
Fig. 4. Changes in the prevalence of people who inject drugs use among the adult population aged 15-64, 2008-2011



Source: UNODC and Reference Group to the United Nations on HIV and Injecting Drug Use.

Note: A ratio of 1.0 indicates no change in the estimates. Chart shows countries where the prevalence of injecting drug use has at least either doubled (ratio is 2.0 or greater) or halved (ratio is 0.5 or less). Changes in prevalence may reflect improved reporting on prevalence estimates, as well as changes in injecting behaviour.

Fig. 5. Changes in the number of people who inject drugs among the adult population aged 15-64, 2008-2011



Source: UNODC and Reference Group to the United Nations on HIV and Injecting Drug Use.

Note: Changes may reflect improved reporting on prevalence estimates, as well as changes in injecting behaviour.

than four times the global average. Injecting drug use also remains a serious public health concern in a number of countries in East and South-East Asia, with the region accounting for 27 per cent of the global total. South Asia has the lowest level of injecting drug use (0.03 per cent, mostly as a result of the low prevalence rate reported in India), considerably lower than that of any other region.

Countries and areas with the highest rates of injecting drug use – more than 3.5 times the global average — are Azerbaijan (5.2 per cent), Seychelles (2.3 per cent), the Russian Federation (2.3 per cent), Estonia (1.5 per cent), Georgia (1.3 per cent), Canada (1.3 per cent), the Republic of Moldova (1.2 per cent), Puerto Rico (1.15 per cent), Latvia (1.15 per cent) and Belarus (1.11 per cent). China, the Russian Federation and the United States are the countries with the largest numbers of people who inject drugs. Combined, they account for an estimated 46 per cent, or nearly one in two, people who inject drugs globally.

HIV among people who inject drugs

Of the estimated 14.0 million (range: 11.2 million to 22.0 million) people who inject drugs worldwide, UNODC estimates that 1.6 million (range: 1.2 million to 3.9 million) are living with HIV. That represents a global prevalence of HIV of 11.5 per cent among people who inject drugs.[15]

Along with the estimates of the total number of people who inject drugs, the global total and prevalence rates of people who inject drugs living with HIV for 2011 is also lower than the estimated 3 million (18.9 per cent prevalence among people who inject drugs) previously presented by the Reference Group to the United Nations on HIV and Injecting Drug Use for 2008. These reduced estimates are in large part a result of the availability of more reliable information on HIV prevalence among people who inject drugs.

The total number of people who inject drugs and are living with HIV in a particular region is a function of three variables: the prevalence of HIV among people who inject drugs; the prevalence of people who inject drugs; and the total population in the region aged 15-64. These variables are depicted in figure 8.

There is relatively little regional variation in the prevalence of HIV among people who inject drugs, especially in comparison with the variation observed in the prevalence of people who inject drugs. The one exception is Oceania (based on data from Australia and New Zealand), where the prevalence of HIV among people who inject drugs is noticeably lower than in all other regions. Overall, the Russian Federation, the United States and China account for one half (46 per cent) of the global number of people who inject drugs that are living with HIV (21 per cent, 15 per cent and 10 per cent, respectively).

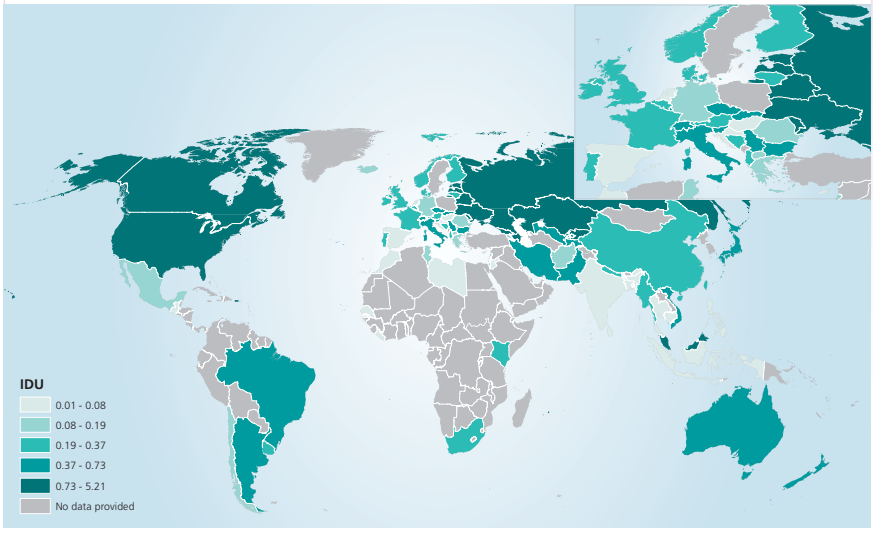
Table 2. People who inject drugs living with HIV, 2011

Region	Subregion	HIV among injecting drug users			
		Estimated number			Prevalence (%) Best estimate
		Low	Best	High	
AFRICA		36,506	117,502	1,837,542	11.8
AMERICA		222,053	369,445	560,134	10.8
	North America	159,836	270,749	383,041	13.5
	Latin America and the Caribbean	62,217	98,696	177,093	6.9
ASIA		440,559	637,271	928,476	11.2
	Central Asia and Transcaucasia	54,858	59,193	71,352	8.5
	East and South-East Asia	256,396	328,101	519,982	8.7
	Near and Middle East/South-West Asia	108,539	228,765	315,430	24.0
	South Asia	20,767	21,212	21,712	8.4
EUROPE		466,243	492,054	532,304	13.0
	Eastern/South-Eastern Europe	419,715	433,836	448,183	14.9
	Western/Central Europe	46,528	58,217	84,120	6.7
OCEANIA		1,095	1,308	1,635	1.0
GLOBAL		**1,166,456**	**1,617,580**	**3,860,091**	**11.5**

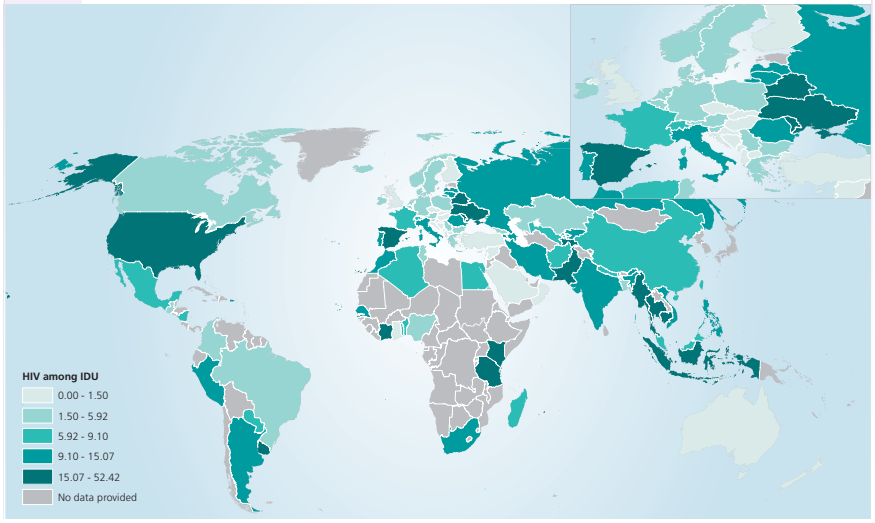
Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire; progress reports of the Joint United Nations Programme on HIV/AIDS (UNAIDS) on the global AIDS response (various years); the Reference Group to the United Nations on HIV and Injecting Drug Use; estimates based on United Nations Office on Drugs and Crime data; and national Government reports.

15 The estimate is based on the reporting of the HIV prevalence rate among people who inject drugs from 106 countries.

Map 1. **Prevalence of people who inject drugs among the general population aged 15-64, 2011 or latest year available**



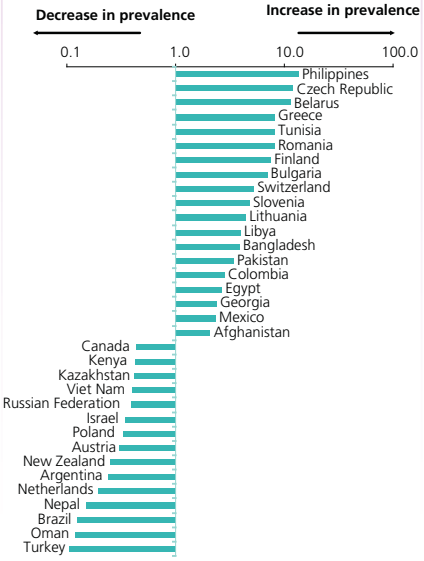
Map 2. **Prevalence of HIV among people who inject drugs, 2011 or latest year available**



Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire; progress reports of the Joint United Nations Programme on HIV/AIDS (UNAIDS) on the global AIDS response (various years); the Reference Group to the United Nations on HIV and Injecting Drug Use; estimates based on United Nations Office on Drugs and Crime data; and national Government reports.

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined.

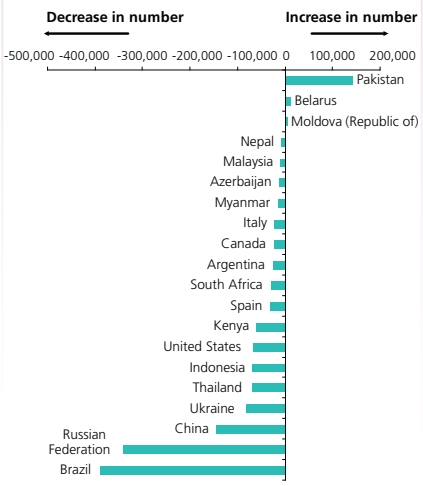
Fig. 6. **Changes in the prevalence of HIV among people who inject drugs, 2008-2011**



Source: UNODC and Reference Group to the United Nations on HIV and Injecting Drug Use.

Note: Ratio of latest to previous Reference Group estimates of the prevalence of HIV among injecting drug users. A ratio of 1.0 indicates no change in the estimates. Chart shows countries where the prevalence of HIV among injecting drug users has either at least doubled (ratio is 2.0 or greater) or halved (ratio is 0.5 or less). Changes may reflect improved reporting on prevalence estimates as well as changes in injecting behaviour and HIV infection.

Fig. 7. **Changes in the number of people who inject drugs living with HIV from 2008 to 2011**



Source: UNODC and Reference Group to the United Nations on HIV and Injecting Drug Use.

Note: Calculation based on 2011 adult population. Changes may reflect improved reporting on prevalence estimates, as well as changes in injecting behaviour and HIV infection.

Fig. 8. **Prevalence rates for people who inject drugs and prevalence and number of people who inject drugs living with HIV (by region)**

	Population (aged 15-64) (1,000's)	Prevalence (%) IDUs among population aged 15-64	Prevalence (%) HIV among IDUs	Number of IDUs living with HIV (1,000's)
Oceania		0.53	1.0	1.3
Western/ Central Europe		0.27	6.7	58.2
Eastern/ South-Eastern Europe		1.26	14.9	433.8
South Asia		0.03	8.4	21.2
Near and Middle East / South-West Asia		0.36	24.0	228.8
East and South-East Asia		0.25	8.7	328.1
Central Asia and Transcaucasia		1.33	8.5	59.2
latin America and the Carribbean		0.45	6.9	98.7
North America		0.65	13.5	270.7
Africa		0.17	11.8	117.5

Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire and national Government reports.

Note: IDUs stands for injecting drug users.

The region with the highest prevalence of HIV among people who inject drugs is the Near and Middle East/South-West Asia (24 per cent). This is driven primarily by high rates of HIV among people who inject drugs in Pakistan (37.0 per cent) and Iran (Islamic Republic of) (15.1 per cent). Almost 30 per cent of the global population who inject drugs and are living with HIV, however, are in Eastern and South-Eastern Europe. Similar to Pakistan, Ukraine has a large population of people who inject drugs, with a very high prevalence of HIV (22.0 per cent).

International data show that rates of HIV prevalence are much higher among prison inmates than the general population.[16] From the annual report questionnaire, the reported prevalence rate of HIV in the prison population varies from 0.2 per cent in Hungary to 15 per cent in Kyrgyzstan; these rates are between 2 and 37 times higher than in the general adult population.

Hepatitis among people who inject drugs

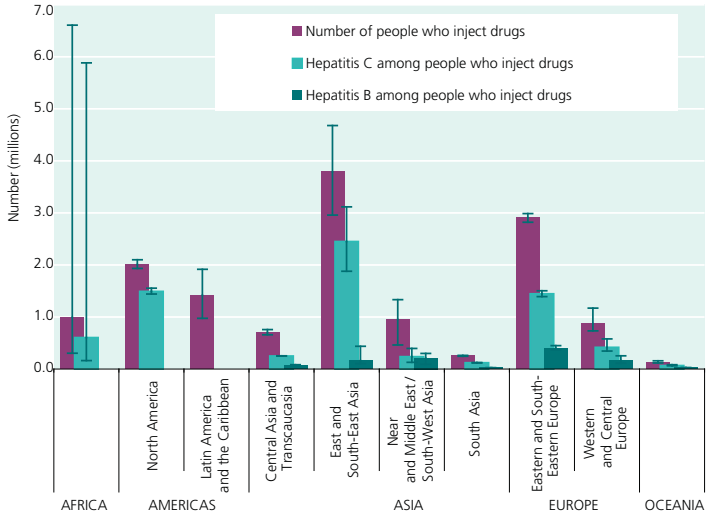
Another major global public health concern is hepatitis C, which can lead to liver diseases such as cirrhosis and cancer. Infection with the hepatitis C virus (HCV) is highly prevalent among people who inject drugs. UNODC estimates that the global prevalence of HCV among people who inject drugs is 51.0 per cent, meaning that 7.2 million people who inject drugs were living with HCV in 2011.[17]

The largest numbers of people who inject drugs and are living with HCV are found in East and South-East Asia, Eastern and South-Eastern Europe and North America. The highest HCV prevalence rates among people who inject drugs in countries with predominantly large numbers of people who inject drugs (more than 100,000 to help ensure that a stable prevalence can be determined) are mostly located in North America and East and South-East Asia: Mexico (96.0 per cent), Viet Nam (74.1 per cent), United States (73.4 per cent), Canada (69.1 per cent), Malaysia (67.1 per cent), China (67.0 per cent) and Ukraine (67.0 per cent).

The global prevalence of the hepatitis B virus (HBV) in 2011 among people who inject drugs is estimated at 8.4 per cent, or 1.2 million people, based on reporting from 63 countries. The highest prevalence of HBV among people who inject drugs is found in the Near and Middle East/South West Asia (22.5 per cent) and Western and Central Europe (19.2 per cent).

As is the case for other infectious diseases, such as tuberculosis and HIV, the prevalence of hepatitis and, in particular, hepatitis C, is very high among the prison

Fig. 9. Estimated number of people who inject drugs, and number of people who inject drugs living with hepatitis B and hepatitis C

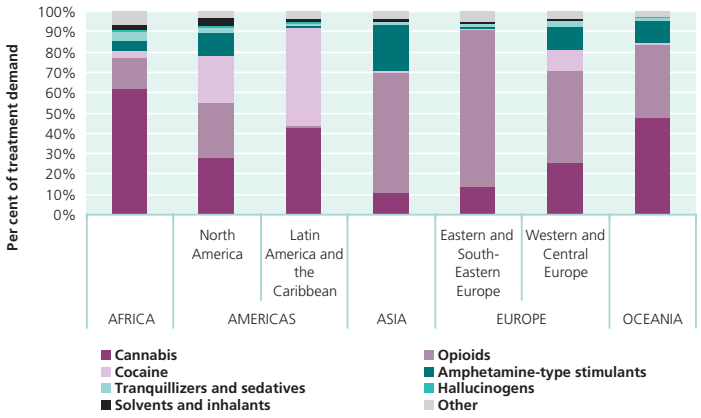


Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire and national Government reports.

16 United Nations Office on Drugs and Crime, International Labour Organization, United Nations Development Programme and World Health Organization, policy brief on "HIV prevention, treatment and care in prisons and other closed settings: a comprehensive package of interventions" (2012).

17 The estimate is based on reporting from 78 countries.

Fig. 10. Primary drug of concern for people in treatment, by region (2011 or latest year available)



Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire, supplemented by national Government reports.

Drug treatment: costs and benefits

There are different treatment modalities available in different countries, and studies have shown that treatment interventions can have great benefits. Long-term drug treatment may, on average, save money, and result in a host of other benefits. Data demonstrate that the benefits of treatment vary according to the drug of choice and the severity of dependence. In a meta-analysis of over 34 randomized controlled trials, cognitive behavioural therapy was found to have the largest effect on cannabis dependence, followed by opioid dependence and polysubstance dependence.[a] Cognitive behavioural therapy has also been shown to be effective against substance abuse occurring in tandem with suicidal thoughts in adolescents.[b] Opiate substitution therapy has also proven to increase the probability of survival, owing to a lower rate of suicide attempts, diminished likelihood of HIV transmission and reduced participation in crime. A comparison of involvement in criminal activity, pre- and post-treatment, shows a significant drop after therapy for a variety of criminal behaviours. In a study of over 23,000 people who inject drugs, the incidence of HIV was 54 per cent lower among those who had received methadone maintenance therapy compared with those who did not. Additional benefits to society include lower rates of driving under the influence of drugs or alcohol, and higher employment among treated users. In the United States, one year of methadone maintenance treatment for opioid dependence costs approximately $4,700, whereas one year of imprisonment costs approximately $24,000. The weight of evidence shows enormous benefits, both in dollars saved and improved quality of life.

[a] R. K. McHugh, B. A. Hearon and M. W. Otto, "Cognitive-behavioural therapy for substance use disorders", *Psychiatric Clinics of North America*, vol. 33, No. 3 (2010), pp. 511-525.
[b] C. Esposito-Smythers and others, "Treatment of co-occurring substance abuse and suicidality among adolescents: a randomized trial", *Journal of Consulting and Clinical Psychology*, vol. 79, No. 6 (2011), pp. 728-739.

Sources: United States, Department of Health and Human Services, National Institute on Drug Abuse, *Principles of Drug Addiction Treatment: A Research-based Guide*, 3rd ed., NIH publication No. 12-4180 (2012); J. Kimber and others, "Survival and cessation in injecting drug users: prospective observational study of outcomes and effect of opiate substitution treatment", *British Medical Journal*, vol. 341, No. 7764 (17 July 2010), p.135 L. Cottler and others, "Predictors of high rates of suicidal ideation among drug users", *Journal of Nervous and Mental Disease*, vol. 193, No. 7 (2005), pp. 431-437; M. A. Ilgen and others, "Substance use-disorder treatment and a decline in attempted suicide during and after treatment", *Journal of Studies on Alcohol and Drugs*, vol. 68, No. 4 (2007), pp. 503-509; M. Jofre-Bonet and J. L. Sindelar, "Drug treatment as a crime fighting tool", *Journal of Mental Health Policy and Economics*, vol. 4, No. 4 (2001), pp. 175-178;
A. Healey and others, "Criminal outcomes and costs of treatment services for injecting and non-injecting heroin users: evidence from a national prospective cohort survey", *Journal of Health Services Research and Policy*, vol. 8, No. 3 (2003), pp. 134-141; I. Sheerin and others, "Reduction in crime by drug users on a methadone maintenance therapy programme in New Zealand", *New Zealand Medical Journal*, vol. 117, No. 1190 (12 March 2004); G. J. MacArthur and others, "Opiate substitution therapy and HIV transmission in people who inject drugs: systematic review and meta-analysis", *British Medical Journal*, vol. 345, No. 7879 (20 October 2012); G. D'Onofrio and others, "A brief intervention reduces hazardous and harmful drinking in emergency department patients", *Annals of Emergency Medicine*, vol. 60, No. 2 (2012), pp. 181-192; and M. Bilban, A. Kastelic and L. M. Zaletel-Kragelj, "Ability to work and employability of patients in opioid substitution treatment programs in Slovenia", *Croatian Medical Journal*, vol. 49, No. 6 (2008), pp. 842-852.

population: more than 10 per cent in most cases and up to 42 per cent in Finland and 45 per cent in New Zealand.

Problem drug use as reflected by the demand for treatment

It is estimated that approximately one in six problem drug users[18] globally receives treatment for drug use disorders or dependence each year. However, there is a greater than six fold variation between the regions. Africa, in particular, stands out, with only one in 18 problem drug users accessing treatment services, predominantly for treatment related to cannabis use disorders. In Latin America and the Caribbean and Eastern and South-Eastern Europe, approximately one in 11 problem drug users accesses treatment services, well below the global average. Conversely, in North America, each year an estimated one in three problem drug users receives treatment interventions. To a certain extent, these regional differences reflect varying reporting systems for treatment demand,[19] but they also undoubtedly demonstrate the wide disparity in the availability and accessibility of drug dependance treatment services in different regions.

Drug-related deaths

Drug-related deaths show the extreme harm that can result from drug use. These deaths are invariably premature, occurring at a relatively younger age. For example, according to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA), the mean age for drug-related deaths for countries in Europe varies from 26 to 44 years, and such deaths can largely be prevented.

UNODC estimates that there were between 102,000 and 247,000 drug-related deaths in 2011, corresponding to a mortality rate of between 22.3 and 54.0 deaths per million population aged 15-64. This represents between 0.54 per cent and 1.3 per cent of mortality from all causes globally among those aged 15-64.[20] The extent of drug-related deaths has essentially remained unchanged globally and within regions.

Regional trends in drug use

Africa

Africa remains a region with minimal systematic information available on either the extent of or patterns or trends related to drug use. Nevertheless, estimates from Africa indicate a high prevalence of cannabis use (7.5 per cent, or nearly double the global average), which is particularly high in West Africa. The use of ATS (0.9 per cent), cocaine (0.4 per cent) and opiates (0.3 per cent) remains comparable with the global average.

The use of opioids is perceived to be increasing significantly in Africa, with experts in the region also reporting an increase. Many countries also reported an increase in use of cannabis, ATS and cocaine in 2011. Cocaine use in particular is perceived to be increasing in the Western coastal countries and is considered to be linked with the trafficking of cocaine into and through the region. A recent study in the Dakar region of Senegal indicated that, while heroin use had declined since 2000, consumption of crack

Table 3. Estimated number of drug-related deaths and mortality rates per million population aged 15-64 for 2011

Region	Number of drug-related deaths			Mortality rate per million aged 15-64		
	Estimate	Lower estimate	Upper estimate	Estimate	Lower estimate	Upper estimate
Africa	36,435	17,336	55,533	61.9	29.4	94.3
North America	47,813	47,813	47,813	155.8	155.8	155.8
Latin America and the Caribbean	4,756	3,613	8,097	15.0	11.4	25.6
Asia	104,116	16,125	118,443	37.3	5.8	42.4
Western and Central Europe	8,087	8,087	8,087	24.9	24.9	24.9
Eastern and South-Eastern Europe	7,382	7,382	7,382	32.1	32.1	32.1
Oceania	1,957	1,685	1,980	80.8	69.6	81.8
Global	**210,546**	**102,040**	**247,336**	**45.9**	**22.3**	**54.0**

Source: United Nations Office on Drugs and Crime, data from the annual reports questionnaire, the Inter-American Drug Abuse Control Commission (CICAD) and the European Monitoring Centre for Drugs and Drug Addiction, Louisa Degenhardt and others, "Illicit drug use", in *Comparative Quantification of Health Risks: Global and Regional Burden of Disease Attributable to Selected Major Risk Factors,* vol. 1, M. Ezaati and others, eds. (Geneva, World Health Organization, 2004). Data for Africa have been adjusted to reflect the 2011 population. The wide range in the estimates for Asia reflects the low level of reporting from countries in the region. The best estimate for Asia is towards the upper end of the range, because a small number of highly populated countries report a relatively high mortality rate, which produces a high regional average.

18 Those who regularly use opiates, cocaine or amphetamines, are people who inject drugs or are diagnosed with dependence or substance use disorders.

19 Member States may report treatment episodes rather than persons in treatment, include only inpatient services or provide data that is geographically limited (e.g. for only the capital city).

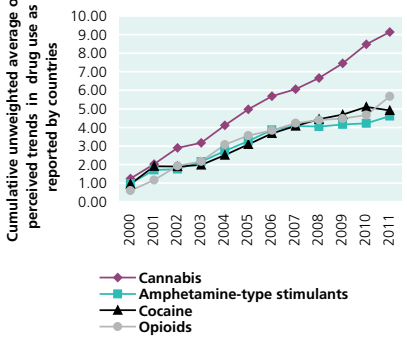
20 According to *World Population Prospects: The 2010 Revision* (United Nations, Department of Economic and Social Affairs), an average of 18.94 million deaths will occur each year for those aged 15-64 from all causes of mortality during the period 2010-2015.

Drug-related deaths in the United Kingdom of Great Britain and Northern Ireland

Within the United Kingdom, data from England and Wales show that drug misuse[a] was responsible for 10 per cent of deaths from all causes for those aged 20-39 in 2011.[b] Heroin and morphine accounted for most of the deaths, but between 2010 and 2011 the number of deaths associated with these two drugs declined by 25 per cent, from 791 to 596. This decline might have been associated with the heroin "drought" experienced in the United Kingdom starting in 2010. However, over the same time period, the number of deaths related to the use of methadone, reportedly mixed with benzodiazepines and/or alcohol, increased by 37 per cent, from 355 to 486.[c] A similar situation was observed in Scotland, where there was a 19 per cent decline in the number of deaths involving heroin and morphine, from 254 in 2010 to 206 in 2011, with a simultaneous 58 per cent increase in the number of deaths associated with methadone, from 174 in 2010 to 275 deaths in 2011.[d] Across the United Kingdom, the involvement of multiple substances implicated in drug-related deaths, notably the use of opiates/opioid analgesics, benzodiazepines and alcohol, has been noted,[e] highlighting the increased risk associated with polydrug use.

[a] The definition of this indicator is (a) deaths where the underlying cause is drug abuse or drug dependence or (b) deaths where the underlying cause is drug poisoning and where any of the substances controlled under the Misuse of Drugs Act 1971 are involved.
[b] Based on data from the United Kingdom, Office for National Statistics, "Deaths relating to drug poisoning in England and Wales, 2011", Statistical Bulletin (August 2012).
[c] Ibid.
[d] *Drug-related Deaths in Scotland in 2011* (National Records of Scotland, August 2012).
[e] Hamid Ghodse and others, *Drug-related Deaths in the UK: Annual Report 2012* (International Centre for Drug Policy, St. George's, University of London, London, 2013).

Fig. 11. Cumulative unweighted average of perceived trends in drug use in Africa by drug type



Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire.

cocaine had increased, and that currently between 70 per cent and 80 per cent of crack users were also using heroin.[21] Similarly, heroin trafficking through the coastal regions of East Africa is believed to have caused an increase in heroin and injecting drug use. In a behavioural surveillance study among people who inject drugs in Seychelles, heroin was the most commonly injected substance; other substances commonly used by injectors included cannabis and alcohol.[22] In Kenya, heroin was the primary drug used by people who inject drugs, while polydrug use of cannabis and flunitrazepam was also commonly reported among those injecting drugs.[23]

In Nigeria, cannabis remains the most commonly used substance, but opioid use is also perceived to be increasing. The misuse of prescription opioids such as pentazocine and codeine-containing cough syrups is considered to be particularly problematic.[24] South Africa reported an increase in the use of heroin, methamphetamine and methcathinone, while cocaine use remained stable. Treatment facilities across the country reported that heroin use was a growing concern. Polydrug use was also reported as a common phenomenon among drug users in treatment, e.g. the use of cannabis and methaqualone among methamphetamine users and methamphetamine among heroin users, as was the use of benzodiazepines, narcotic analgesics and codeine-containing preparations.[25]

In North Africa, recent information on drug use is available from Algeria and Morocco. While the overall prevalence of different drugs is low in Algeria (use of any illicit drug was reported among 1.15 per cent of the adult population), an increase in the misuse of cannabis and tranquilizers and sedatives has been reported, while the use of opioids and ATS is considered stable. However, an increase in injecting ATS was reported.[26] In Morocco, use of can-

21 Gilles Raguin and others, "Drug use and HIV in West Africa: a neglected epidemic", *Tropical Medicine and International Health*, vol. 16, No. 9 (2011), pp. 1131-1133.

22 Seychelles, Ministry of Health, "Injecting drug use in the Seychelles, 2011: integrated biological and behavioural surveillance study, round 1" (2011).

23 "Rapid situational assessment of HIV prevalence and related risky behaviours among people who inject drugs in Nairobi and coast provinces of Kenya", in *Most-At-Risk Populations: Unveiling New Evidence for Accelerated Programming* (Kenya, Ministry of Health, National AIDS and STI Control Programme, March 2012).

24 Information provided by Nigeria in the annual report questionnaire (2012).

25 Siphokazi Dada and others, "Monitoring alcohol and drug abuse trends in South Africa (July 1996-June 2011): phase 30", *SACENDU Research Brief*, vol. 14, No. 2 (2011).

26 Information provided by Algeria and Morocco in the annual report questionnaire (2012).

Driving under the influence of drugs

Worldwide, road traffic injuries are the second most common cause of death for persons between 5 and 29 years of age; 90 per cent of those deaths occur in low- to middle-income countries. The World Health Organization estimates that 1.2 million people die annually from traffic-related injuries and predicts that, by 2030, traffic accidents will be the fifth leading cause of death. Driving under the influence of drugs or alcohol is a powerful predictor of traffic-related deaths; it becomes particularly risky when the two are combined.

While the prevalence rate for driving under the influence of drugs is not known in many parts of the world, recent studies from Brazil, Europe and the United States indicate that it may be more common than previously thought.

In the United States in 2011, 3.4 per cent of those aged 12 and older, or 9.4 million people, reported driving under the influence of illicit drugs. Estimates from the United States indicate that approximately 66 per cent of drivers who test positive for illicit drugs also have alcohol in their system, thereby increasing their risk of causing a fatal traffic accident.

In Brazil, a cross-sectional study of 3,398 drivers found that 4.6 per cent of them tested positive for some illicit substance. Of those who tested positive, 39 per cent tested positive for cocaine, 32 per cent for tetrahydrocannabinol (THC) (cannabis), 16 per cent for amphetamines and 14 per cent for benzodiazepines. In another study in Brazil, drug testing on patients who were admitted to the emergency room after traffic accidents showed that such patients were more likely to have cannabis in their system than alcohol.

In Europe, in a sample of 50,000 randomly tested drivers from 13 countries, approximately 1.9 per cent of drivers tested positive for an illicit substance: traces of THC were detected in 1.3 per cent, cocaine in 0.4 per cent, amphetamines in 0.08 per cent and illicit opioids in 0.07 per cent. Additionally, benzodiazepines were found in 0.9 per cent and medical opioids among 0.35 per cent of European drivers. Among the general driving population, illicit drugs were detected mainly among young male drivers, and at all times of the day, but mostly at the weekends.

Sources: M. Peden and others, eds., *World Report on Road Traffic Injury Prevention* (Geneva, World Health Organization, 2004); United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, *Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings,* NSDUH Series H-44, HHS Publication No. SMA 12-4713 (Rockville, Maryland, 2012); Substance Abuse and Mental Health Services Administration, "The NSDUH report: state estimates of drunk and drugged driving" (Rockville, Maryland, 2012); European Monitoring Centre for Drugs and Drug Addiction, *Driving Under the Influence of Drugs, Alcohol and Medicines in Europe: Findings from the DRUID Project* (Luxembourg, Publications Office of the European Union, 2012); and Flavio Pechansky, Paulina do Carmo Arruda Vieira Duarte and Raquel Brandini De Boni, *Use of Alcohol and Other Drugs on Brazilian Roads and Other Studies* (Porto Alegre, National Secretariat for Drugs Policies, September 2010).

nabis and ATS was reported as stable, while the use of cocaine and opiates had increased.

The Americas

In the Americas, a high prevalence of most illicit drugs, essentially driven by estimates in North America, was observed, with the prevalence of cannabis (7.9 per cent) and cocaine (1.3 per cent) being particularly high in the region.

North America

In North America, the annual prevalence of all illicit drugs has remained stable and, except for opiate use, is at levels much higher than the global average.

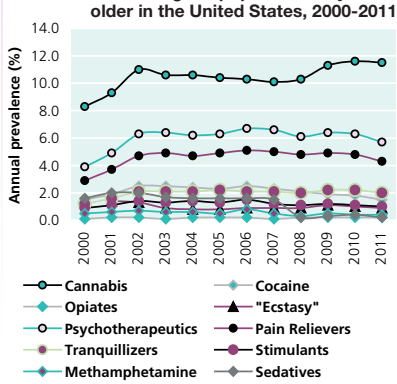
Overall, use of illicit drugs in the United States has remained stable, at an estimated 14.9 per cent of the population aged 12 years and older in 2011, compared with 15.3 per cent in 2010.[27] Prevalence of cannabis use has also remained stable, though at high levels: 11.5 per cent in 2011, compared with 11.6 per cent in 2010 among the population aged 12 years and older. Cannabis use has continued to increase among high-school students. In 2011, an estimated 1 in 15 high-school seniors was a daily or near-daily user of cannabis. Synthetic marijuana, otherwise known as Spice or K2, was assessed for the first time; approximately 11.4 per cent of high school students reported its use in the previous year. The overall prevalence of non-medical use of psychotherapeutics (pain relievers, tranquilizers and sedatives, and stimulants) among persons 12 years or older in the past year also declined, from 6.3 per cent in 2010 to 5.7 per cent in 2011. Similarly, a decline was observed in the use of inhalants, cocaine, prescription painkillers, amphetamine and tranquillizers among high-school students. While the prevalence of "ecstasy" use in 2011 remained stable among the general population, past-year use of "ecstasy" increased among twelfth graders and declined slightly for eighth and tenth graders.

In Canada, the reported use of cannabis in the past year among the population aged 15 years and older declined from 10.7 per cent in 2010 to 9.1 per cent in 2011.[28] The

27 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, *Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings*, NSDUH Series H-44, HHS Publication No. SMA 12-4713 (Rockville, Maryland, 2012).

28 Information provided by Canada in the annual report questionnaire (2011). It is reported that, with high sampling variability and a coef-

Fig. 12. Trends in annual prevalence of drug use among the population 12 years and older in the United States, 2000-2011



Source: United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, *Results from the 2011 National Survey on Drug Use and Health: Summary of National Findings,* NSDUH Series H-44, HHS Publication No. SMA 12-4713 (Rockville, Maryland, 2012).

use of other substances, including opioids, cocaine and methamphetamine, was reported as stable. The use of the psychoactive plant *Salvia divinorum* among young people in Canada remains of concern.

For Mexico, new estimates for 2011, as well as expert perception, indicate a slight increase since 2008 in the use of cocaine (from 0.4 per cent in 2008 to 0.5 per cent in 2011) and ATS (0.1 per cent to 0.2 per cent). There was also some increase in the use of cannabis and opioids, while use of tranquillizers and sedatives was perceived to be stable.[29]

South America, Central America and the Caribbean

The annual prevalence of cocaine use in South America (1.3 per cent of the adult population) is comparable to levels in North America, while it remains much higher than the global average in Central America (0.6 per cent) and the Caribbean (0.7 per cent).

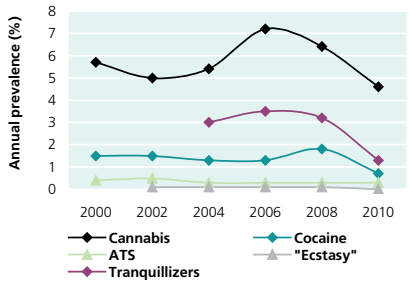
Cocaine use has increased significantly in Brazil, Costa Rica and, to lesser extent, Peru while no change in its use was reported in Argentina. The use of cannabis in South America is higher (5.7 per cent) than the global average, but lower in Central America and Caribbean (2.6 and 2.8 per cent respectively). In South America and Central

ficient of variation between 16.7 per cent and 33.3 per cent, the estimates of amphetamine, "ecstasy" and lysergic acid diethylamide (LSD) should be interpreted with caution. Since the coefficient of variation was greater than 33.3 per cent and/or the number of observations was less than six, the past-year estimates for opioids, tranquillizers and sedatives, and *Salvia divinorum* are suppressed and not reported.

29 Information provided by Mexico in the annual report questionnaire (2011).

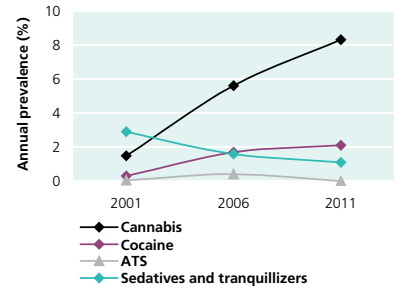
Fig. 13. Trends in drug use in selected South American countries

A. Chile



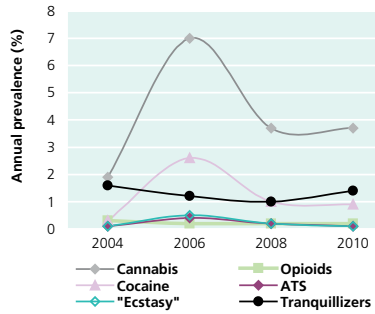
Source: Chile, Consejo Nacional para el Control de Estupefacientes (CONACE), Ministerio del Interior y Seguridad Pública, *Noveno Estudio Nacional De Drogas en Población General*, 2010 (Santiago, June 2011).

B. Uruguay



Source: Uruguay, Junta Nacional de Drogas, Observatorio Uruguayo de Drogas, *Quinta Encuesta Nacional en Hogares sobre Consumo de Drogas: Informe de Investigación* (May 2012).

C. Argentina



Source: Argentina, Secretaría de Programación para la Prevención de la Drogadicción y Lucha contra el Narcotráfico (SEDRONAR), *Tendencia en el Consumo de Sustancias Psicoactivas en Argentina 2004-2010: Población de 16 a 65 Años* (June 2011).

America the use of opioids (0.3 and 0.2 per cent, respectively) and Ecstasy (0.1 per cent each) also remain well below the global average. While opiates use remains low, countries such as Colombia report that heroin use is becoming increasingly common among certain age groups and socio-economic classes.[30]

Asia

Reliable estimates of the prevalence of different drugs are available for only a few countries in Asia. Overall, drug use in the region remains at low levels. While the annual prevalence rate of use of ATS ranges between 0.2 and 1.2 per cent of the adult population, and that of opioids between 0.3 and 0.5 per cent, the annual prevalence rates for the use of cannabis (1.0–3.1 per cent), "ecstasy" (0.1–0.7 per cent) and cocaine (0.05 per cent) are considerably lower than the global average. In absolute numbers, however, Asia is home to an estimated one quarter to 40 per cent of all illicit drug users worldwide, as well as 60 per cent of opiate users and between 30 and 60 per cent of ATS users.

Recent data available from Pakistan and China indicate an increase in the use of opiates, as well as of ATS. A new survey on drug use, conducted in Pakistan in 2012, reported cannabis as the most commonly used drug, with an annual prevalence of 3.6 per cent, followed by prescription opioids (1.5 per cent) and tranquillizers and sedatives (1.4 per cent). Opiate use (0.9 per cent), though high, remained at levels lower than in Afghanistan and Iran (Islamic Republic of). Most of the opiate use was linked to heroin (0.7 per cent) and, to a lesser extent, opium (0.3 per cent). Use of ATS (0.1 per cent) and cocaine (0.01 per cent) appeared to be low but emerging.

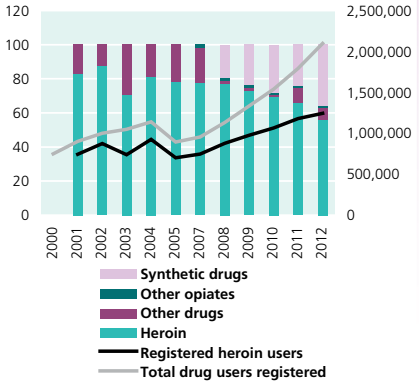
Opioid use remains high in China, with the number of registered heroin users increasing each year: there were 1.24 million in 2011, compared with 1.06 million in 2010. The number and proportion of registered users of ATS are also increasing (38 per cent of all registered users in 2012, compared with 28 per cent in 2010). In addition, there has been a major increase in the number of drug users registered for use of other substances, such as ketamine. In 2012, more than 7 per cent of registered drug users were using ketamine.

The first-ever national survey on drug use in the Maldives was conducted in 2011/12. Cannabis was found to be the most commonly used substance, followed by opiates (annual prevalence of 2.5 per cent and 1.54 per cent, respectively, of the adult population). The use of prescription opioids, cocaine, ATS, sedatives and tranquillizers though, appeared to be less common.[31]

30 Ministerio de Salud y Protección Social - República de Colombia, Preventing the Spread of Heroin Consumption in the Americas: the Colombian Experience". 51st Regular Session of CICADA/OAS, May 2012

31 United Nations Office on Drugs and Crime, *National Drug Use Survey: Maldives* — 2011/2012 (2013).

Fig. 14. Trends in registered drug users and proportion of registered drug users in China, 2000-2011



Source: Information provided by China in the annual report questionnaire, and annual reports on drug control in China published by the Office of the National Narcotics Control Commission of China.

In Asia, experts from East and South-East Asia reported higher levels of ATS use in 2011. Ketamine use also remained widespread in some countries in the region, and was reported in Brunei Darussalam, China, Indonesia, Malaysia and Singapore.

In Central Asia and Transcaucasia, use of opioids, especially heroin and opium, remains of primary concern, with annual prevalence estimated at 0.9 per cent of the adult population. Azerbaijan (1.5%), Georgia (1.36%) and Kazakhstan (1%) are the countries with considerably high levels of opioid use in the region. There is limited information available from the Near and Middle East/South-West Asia. While the use of ATS is the primary concern among the Gulf countries, misuse of narcotic analgesics, especially tramadol, is reported as an emerging concern, with some countries also reporting tramadol-related deaths.

Europe

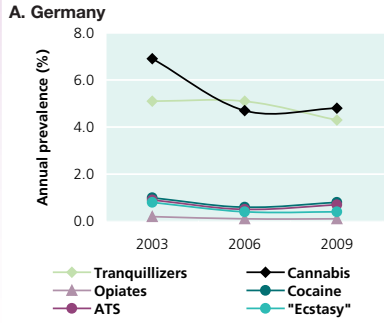
In Europe, cannabis remains the most commonly used of illicit substance, with an annual prevalence of 5.6 per cent, followed by cocaine (0.8 per cent), opioids (0.7 per cent) and ATS (0.5 per cent).

In Western and Central Europe, there are indications, based on prevalence estimates, that the use of most illicit substances is declining or stabilizing at high levels. Concerns remain, however, about the replacement of heroin with prescription opioids, the partial replacement of methamphetamine by amphetamine, particularly in the north of Europe, and the continual increase in the introduction and use of NPS.

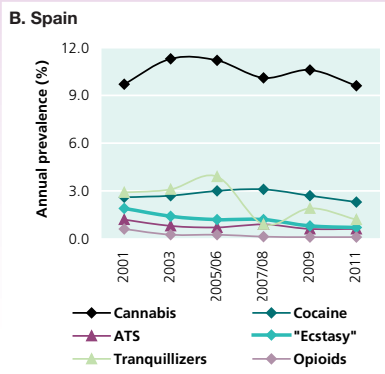
Western and Central Europe

Except for the use of ATS (annual prevalence of 0.7 per cent), the use of all illicit substances in Western and Central Europe remains higher than the global average. The annual prevalence of cannabis use is estimated at 7.6 per cent of the adult population, with declining or stable trends observed in most countries, except in Estonia and Finland, where the rates of cannabis use show no sign of levelling off.[32] The annual prevalence of cocaine use (1.2 per cent) in Western and Central Europe is nearly three times the

Fig. 15. Drug use trends in selected countries in Europe

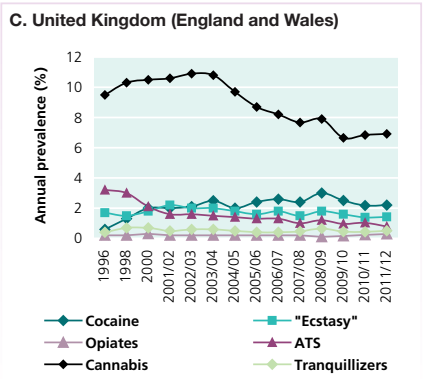


Source: A. Pabst and others, "Substanzkonsum und substanzbezogene Störungen: Ergebnisse des Epidemiologischen Suchtsurveys 2009", *Sucht — Zeitschrift für Wissenschaft und Praxis*, vol. 56, No. 5 (2010), pp. 327-336; L. Kraus and others, "Kurzbericht Epidemiologischer Suchtsurvey 2009: Tabellenband — Prävalenz der Medikamenteneinnahme und problematischen Medikamentengebrauchs nach Geschlecht und Alter im Jahr 2009" (Munich, Institut für Therapieforschung, 2010).

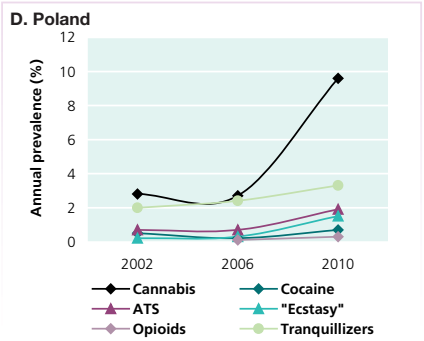


Source: European Monitoring Centre for Drugs and Drug Addiction, *Statistical Bulletin 2012* (available from www.emcdda.europa.eu/stats12); United Nations Office on Drugs and Crime, information provided by Spain in the annual report questionnaire.

32 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe*.



Source: J. Hoare and D. Moon, eds., *Drug Misuse Declared: Findings from the 2009/10 British Crime Survey*—England and Wales, Home Office Statistical Bulletin No. 13/10 (London, Home Office, July 2010); K. Smith and J. Flatley, eds., *Drug Misuse Declared: Findings from the 2010/11 British Crime Survey*—England and Wales, Home Office Statistical Bulletin No. 12/11 (London, Home Office, July 2011); United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales*, 2nd ed. (London, July 2012).



Source: European Monitoring Centre for Drugs and Drug Addiction, Statistical Bulletin 2012 (available from www.emcdda.europa.eu/stats12); United Nations Office on Drugs and Crime, information provided by Poland in the annual report questionnaire.

Table 4. Annual prevalence of cocaine use in high-prevalence countries in Europe

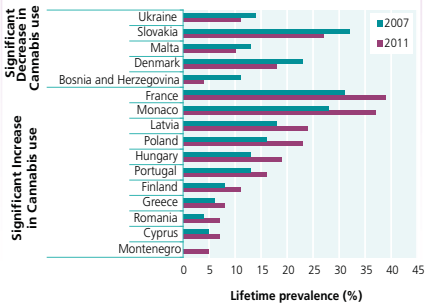
Denmark	0.9 (2010)	1.4 (2008)
Ireland	1.5 (2011)	1.7 (2007)
Spain	2.3 (2011)	2.7 (2009)
England and Wales	2.2 (2011)	2.2 (2010)

UNODC Annual Report Questionnaire; European Monitoring Centre for Drugs and Drug Addiction, *Statistical Bulletin 2012*.

global average, but has been reported as showing a stabilizing or downward trend. Countries with a high prevalence of cocaine use observed a decline or stabilization in its use compared with the previous survey.

The latest school survey of 15- and 16-year-olds in the European Union also indicates evidence of a reduction or stabilization in the use of all major substances. However, polydrug use among school students remains of concern, with nearly 9 per cent of students reporting use of two or more substances. Cannabis use has remained stable overall among school students in Europe since 2007 (17 per cent lifetime prevalence); its use has increased significantly in 11 countries and declined in 5 others. The Czech Republic, France and Monaco are the only European countries with a higher lifetime prevalence of cannabis use among 15- and 16-year-olds (42 per cent, 37 per cent and 39 per cent, respectively) than the United States (35 per cent).

Fig. 16. Trends in cannabis use in European countries that reported a significant change among school students



Source: The European School Survey Project on Alcohol and Other Drugs (ESPAD) Report: Substance Use among Students in 36 European Countries (Stockholm, Swedish Council for Information on Alcohol and Other Drugs, 2012).Note: Data for Denmark compares 2003 and 2011.

Overall, in Western and Central Europe, the prevalence of use of "ecstasy" and ATS has remained stable (0.8 per cent and 0.7 per cent, respectively). While methamphetamine use was previously limited to only the Czech Republic and Slovakia, sporadic reports of methamphetamine smoking and availability of crystal methamphetamine have been reported, notably in the Baltic States and northern Europe, while low levels of use and availability for these substances were also reported from the United Kingdom and Germany.

While over 1 million people are currently estimated to have used opioids — in particular, by injecting heroin — there are signs of a decline in its use, with 60 per cent (710,000) of estimated problem opioid users currently receiving substitution and maintenance therapy. Also, injecting practices are on the decline among new heroin users: only one third (36 per cent) of those entering treatment for heroin-related problems reported injecting as the main method of use.

Indicators from some European Union member States also show that heroin has become less available in recent years, and that in some countries it has been replaced by substances such as fentanyl and buprenorphine. This has been the situation mostly in Estonia and Finland, with sporadic or low levels of activities related to fentanyl use reported from countries such as Greece, Italy and the United Kingdom.[33] In Estonia, the annual prevalence of fentanyl use in 2008 was reported as 0.1 per cent, while it was 1.1 per cent among males aged 15-24. Among drug users registered in treatment, three quarters (76 per cent) were there for fentanyl use. Fentanyl has also been described as endemic among people who inject drugs in Estonia.[34]

There is limited data on fentanyl use in other European countries, but there have been time-limited "outbreaks" of the injection of fentanyl in Bulgaria and Slovakia. Similarly, Finland, Germany and Sweden have reported localized increases in the use of fentanyl and fentanyl-related deaths in recent years.[35]

The number of people using substances such as *gamma*-hydroxybutyric acid (GHB), *gamma*-butyrolactone (GBL), ketamine and, more recently, mephedrone is still relatively low in most European countries, but high levels of use are found in some subpopulations (such as "clubbers"), and it appears that such substances have the potential for more widespread diffusion. A European survey of youth attitudes, in which more than 12,000 young people aged 15-24 were interviewed, estimated that 5 per cent of the respondents had used at least one new psychoactive substance at some point.[36] There have also been reports of health problems linked with these substances, including dependence among chronic users, and some unexpected conditions, such as bladder disease and urinary tract symptoms in ketamine users.[37,38]

Eastern and South-Eastern Europe

Except for the prevalence of opioid use (usually heroin), which is estimated to be 1.2 per cent of the adult population, the use of other illicit substances in Eastern and South-Eastern Europe is quite low compared with global levels. While there is limited new information from the subregion, Belarus has reported an increase in opioid use, with 68 per cent of opioid users injecting mostly locally

33 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe.*

34 European Monitoring Centre for Drugs and Drug Addiction, "Fentanyl in Europe: EMCDDA Trendspotter study" (Luxembourg, Publications Office of the European Union, 2012).

35 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe.*

36 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe.*

37 Ibid.

38 R. Pal and others, "Ketamine is associated with lower urinary tract signs and symptoms", *Drug and Alcohol Dependence* (forthcoming).

made preparations of opium such as "kompot" or "cherniashka",[39] and recent trends in the country indicate an increase in the number of people injecting, as well as in the number of injecting practices, and HIV prevalence among those who inject drugs.[40]

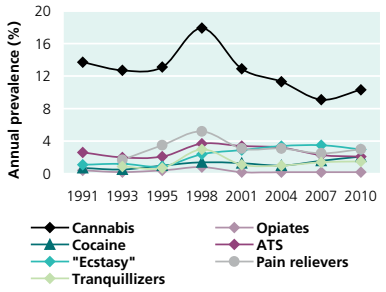
In the Russian Federation, decreased availability of heroin has led to its partial replacement with local and readily available substances such as acetylated opium, as in Belarus, and with desomorphine, a homemade preparation made from over-the-counter preparations containing codeine.[41]

Oceania

The prevalence of the use of most illicit substances remains quite high in the Oceania region - essentially Australia and New Zealand - while quantitative data for the Pacific island States remains limited.[42] High prevalence rates are reported for the use of cannabis (10.9 per cent), opioids (3.0 per cent), "ecstasy" (2.9 per cent), ATS (2.1 per cent) and cocaine (1.5 per cent).

In a new development in Australia, there has been a decrease in the use of "ecstasy" among police detainees. Only 5 per cent of police detainees in 2010 and 2011 reported using "ecstasy", half the percentage who reported such use in 2009. Prior to 2012, an increasing interest in synthetic cannabis products was reported.[43] In New Zealand, GHB/GBL is reported to be sold with methamphetamine "as a package to help users with the comedown effects of methamphetamine".[44]

Fig. 17. Trends in drug use in Australia, 1991-2010



Source: Australia, *National Campaign against Drug Abuse Social Issues Survey reports* for the years 1991 and 1993); and National Drug Strategy Household Survey reports for the years 1995, 1998, 2001, 2004, 2007 and 2010.

39 "Kompot" is a crude preparation from poppy straw, while "cherniashka" is made by mixing locally grown opium poppy with acetic anhydride.

40 Information provided by Belarus in the annual report questionnaire (2011).

41 Information provided by the Russian Federation in the annual report questionnaire (2011).

42 The United Nations Office on Drugs and Crime conducted a workshop, held in Suva, Fiji, from 16 to 19 October 2012 and supported by the Government of Australia, in which national experts reported that cannabis use was quite widespread in Pacific island States and that the non-medical use of prescription drugs such as tramadol, benzodiazepines and other sedatives was reported to be common among some segments of the population. While there are reports of trafficking of cocaine from isolated places in Pacific island States, there is reportedly negligible use among the local population. Similarly, there are indications of local manufacturing of ATS, for instance in Fiji, but negligible use reported among the local population.

B. OVERVIEW OF TRENDS RELATED TO DRUG SUPPLY INDICATORS, BY DRUG TYPE AND REGION

A number of emerging trends have been observed in terms of trafficking of certain types of drugs, as well as the development of new markets and modes of transport across all drug types.

Oceania is the only region that has shown a clear increasing trend in seizures across drug categories; the picture for the rest of the world is more complex.

Another noteworthy phenomenon is that the two classes of stimulants cocaine and ATS, instead of competing, seem to be complementary in nature, fuelling demand for each other instead of cutting into it. This relationship does not exist for any other pair among the four major drug classes.

There are indications of new markets for cocaine, although the available data indicates an overall decline in the market for cocaine at the global level. The picture for opiates is mixed, with increased levels of aggregate seizures of heroin and morphine recorded, alongside reduced levels of seizures of opium close to the major source country of Afghanistan, and declines in seizures of heroin in some of the major consumer markets.

With regard to trafficking, maritime seizures are where the quantities lie. Based on reported data for 1997-2011, each maritime seizure was on average almost 30 times larger than consignments seized while being trafficked by air, and almost four times larger than those trafficked by road and rail, suggesting the need for greater vigilance in this area.

A more comprehensive look at the various drug categories follows.

Cocaine

The available global indicators for the cocaine market suggest that, at a global level, the availability of cocaine has declined, or at least stabilized, in recent years. In contrast with the market for other drugs, the cocaine market is characterized by the fact that not only are the source countries circumscribed within a relatively small area in South

43 Information provided by Australia in the annual report questionnaire (2011).

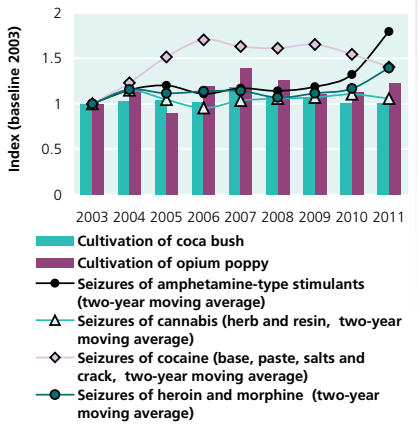
44 Information provided by New Zealand in the annual report questionnaire (2011).

America, but also, until recently, cocaine consumption has been concentrated in specific parts of the globe. Hence, it is plausible that trafficking patterns converged to create certain distinct patterns and routes which were best suited to supply those limited consumer markets.

Consequently, with respect to cocaine specifically, the attention of the global community and the efforts to reduce and measure drug supply and demand may have focused on these well-known routes and markets. More recently, there are indications of emerging cocaine consumption in countries previously not associated with this phenomenon, and it cannot be excluded that the available indicators do not yet fully reflect the extent of global cocaine demand and supply.

In any case, it is clear that regions like Asia and Africa, which together account for the majority of the world's population, and where cocaine use has until recently been relatively low and continues to be largely limited to certain subregions, harbour the potential for a significant demand-driven expansion of the cocaine market.

Fig. 18. Trend in main indicators of drug supply and drug supply reduction, 2003-2011



Source: UNODC, data from the annual report questionnaire and other official sources and International Crop Monitoring Programme (cultivation).

Amphetamine-type stimulants

Seizures of ATS, which showed a remarkable increase in 2011, point to a continued expansion in the global market for these substances. Seizures, mainly of methamphetamine, have increased steadily and substantially in the established producing and consumer regions of North America and East and South-East Asia. Despite recent fluctuations, seizures remain high in the Near and Middle East/South-West Asia, mainly in the form of captagon tablets containing amphetamine and caffeine. In 2011, quantities of ATS seized rebounded in Western and Central Europe, following a decreasing trend from 2007 to 2010. Moreover, seizures of amphetamine in Eastern Europe, while still limited in comparison with global figures, rose to a level significantly higher than those reached previously. Seizures in Oceania, also rebounded from 2009 to 2011.

Cannabis

Cannabis herb continues to be produced, trafficked and consumed in large quantities in all regions. North America accounted for more than half of global seizures of cannabis herb, owing mainly to the quantities seized by Mexico and the United States. Large quantities are also seized in South America and Africa. Afghanistan and Morocco remain the foremost source countries for cannabis resin. Seizures of cannabis resin continue to be concentrated in Western and Central Europe, North Africa, and the Near and Middle East/South-West Asia.

The mixed market of Western and Central Europe, which is a major consumer market for cannabis resin originating in Morocco, but which is also affected by the production and consumption of cannabis herb, has shown signs of gravitating towards more and better quality cannabis herb produced with enhanced techniques (such as indoor cultivation) within the same subregion and trafficked on more localized routes.

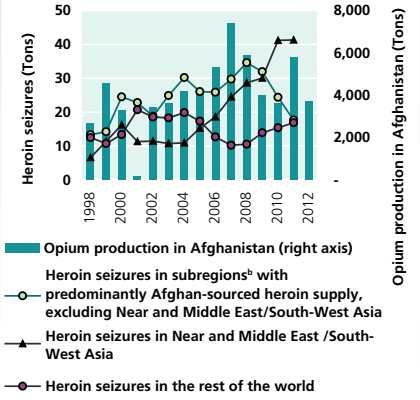
In recent years, seizure totals for Western and Central Europe showed an increase in the case of cannabis herb and a decrease in the case of cannabis resin. Data on the content of tetrahydrocannabinol (THC), the psychoactive ingredient in cannabis, also suggest that the average potency (purity) of cannabis herb currently available in Europe is comparable to that of cannabis resin, which in the past used to be a significantly more potent alternative to cannabis herb.[45]

Opiates

Afghanistan remains by far the largest source country for opiates worldwide. In recent years, Afghanistan registered several high annual production levels, notably in the peak year of 2007, but also in 2008 and 2011, with a decrease between 2007 and 2010 and between 2011 and 2012. As of 2011, aggregate global seizures of morphine and heroin had increased by approximately one half over a period of three years, in spite of the decreasing trend in production over the period 2007-2010. Declines in heroin seizures were observed, however, in specific regions and countries, notably Turkey (in 2010 and 2011), Eastern Europe and Central Asia and the Transcaucasian countries (in 2009, 2010 and 2011), and Western and Central Europe (in 2010). The general picture, in terms of seizure quantities,

45 Based on cannabis potency reported by countries to UNODC through the Annual Report Questionnaire.

Fig. 19. **Breakdown of global heroin seizures in comparison with opium production in Afghanistan, 1998-2012[a]**



Source: UNODC, data from the annual report questionnaire and other official sources and International Crop Monitoring Programme (cultivation).

[a] For 2012, comprehensive seizure data were unavailable.

[b] Western, Central, Eastern and South-Eastern Europe and Central Asia and Transcaucasian countries.

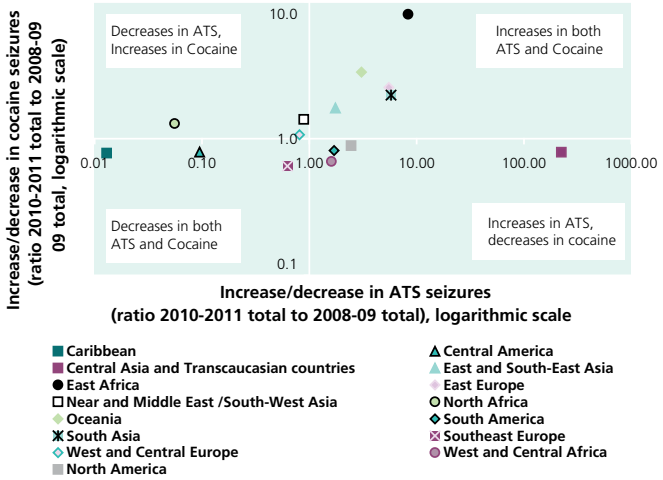
in the Near and Middle East/South-West Asia was mixed and rather erratic, with an increase in heroin seizures in the Islamic Republic of Iran in 2010 followed by a decrease in 2011, a decline in opium seizures in the same country in 2010 and 2011, continuing increases in heroin seizures in Pakistan and a spike in 2011 in morphine seizures in Afghanistan.

Assuming these fluctuations are, at least in part, a consequence of law enforcement activities, and excluding from the aggregate the Near and Middle East/South-West Asia subregion, as well as those regions or subregions whose supply cannot be assumed to be predominantly sourced from Afghanistan (i.e. the Americas, Africa, East, South and South-East Asia and Oceania), a clear decline can be observed, starting gradually in 2009 and becoming sharper in 2010 and 2011. The one-year delay between the onset of the decline in production and that of seizures was also observed in the case of the dramatic drop in production in 2001, and can be linked to the duration of the various stages in the production and trafficking chain, including processing into heroin and trafficking, before heroin reaches destination and transit countries. However, production levels are far from the only factor that influences trends related to seizure levels.

Overall trends across drug classes

An interesting feature can be observed when comparing, subregion by subregion, recent trends with regard to sei-

Fig. 20. **Recent trends in seizures of stimulants: cocaine[a] versus amphetamine-type stimulants,[b] by subregion[c] (total quantity seized in 2008-2009 in comparison with 2010-2011)**



Source: UNODC, data from the annual report questionnaire and other official sources

[a] Includes cocaine salts, cocaine base, coca paste and crack.

[b] Excludes prescription stimulants and other stimulants, which were not covered by the annual report questionnaire prior to the 2010 reporting year.

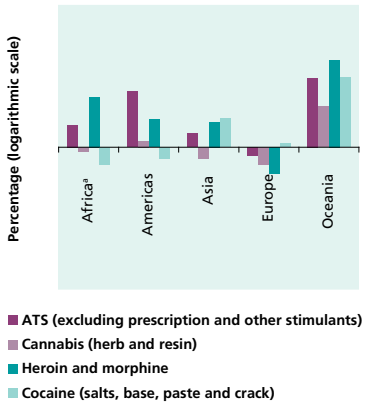
[c] Due to lack of available data, the subregion of Southern Africa is excluded from this chart.

zures of cocaine and ATS, which both consist of stimulant substances. Although by no means conclusive, there are indications that these two classes of stimulants are complementary rather than competitive products; in other words, an increase in demand for one comes together with, and possibly even fuels, the demand for the other, rather than replacing it. This is substantiated by the fact that, while significant increases occurred for both drug classes in parallel in several subregions (East Africa, Eastern Europe, East and South-East Asia, Oceania and South Asia), the tendency for a subregion to register a significant increase in one of the two and a decrease in the other was very limited. A similar relationship cannot be observed when comparing any of the other pairs among the four major drug classes.

A comparison of total quantities of drug seizures between the 2010-2011 biennium and the preceding one shows Oceania as the only region with a clear dominant (increasing) trend across the four different drug classes. This may be due to a considerable extent to renewed vigour in drug supply reduction efforts, in addition to any changes in the trafficked volumes for certain drug types. A rather similar pattern, but in the opposite direction, appears to hold for Europe, but the picture is not as clear, as seizures of cocaine increased slightly and seizures of ATS actually rebounded in 2011.

Asia registered an increase in all drug classes with the exception of cannabis, most notably in the case of cocaine, which is significant in terms of the growth rate and also in view of the size of the population. In the Americas, the exception to the increasing trend was the well-established cocaine market. The available seizure data for Africa was not comprehensive, but a comparison of the totals excluding Southern Africa reveals an increase for seizures of heroin and ATS.

Fig. 21. Recent trends in drug seizures, by drug type and region (2010-2011 totals as a percentage of 2008-2009 totals)



Source: UNODC, data from the annual report questionnaire and other official sources

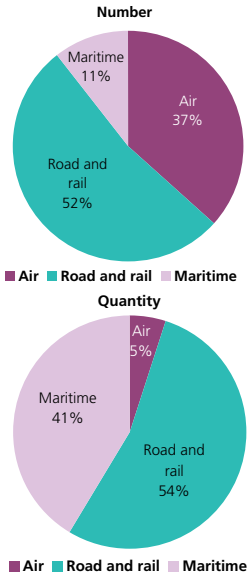
[a]Due to a lack of available data, the subregion of Southern Africa is excluded from the calculation of the trends for Africa.

Modes of transportation

While cases involving maritime trafficking are the least common among cases involving the three modes of transportation of road and rail, maritime and air,[46] the frequency distribution of seizure cases by weight of seizure reveals that a maritime seizure is consistently the most likely to be a large seizure (from10 kg onwards).

When individual drug seizure cases (of all drug types) reported to UNODC are broken down into the three different modes of transportation mentioned above, cases of maritime trafficking constitute only 11 per cent of cases in spite of the fact that they consistently account for a significant proportion of the quantity seized. Indeed, at

Fig. 22. Distribution of mode of transportation[a] of individual drug seizure cases reported to UNODC, 1997-2011

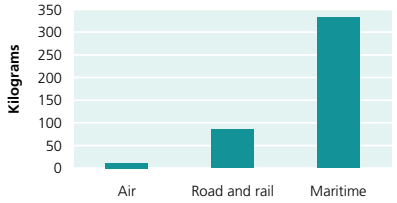


Source: United Nations Office on Drugs and Crime, individual drug seizure database.

[a] Excludes cases in which the mode of transportation was unknown, not applicable or specified as "other".

46 This breakdown excludes cases in which the mode of transportation was unknown, not applicable or specified as "other". In particular, seizures involving mail (which could be transported by air, sea or land) and seizures of drugs in storage are excluded.

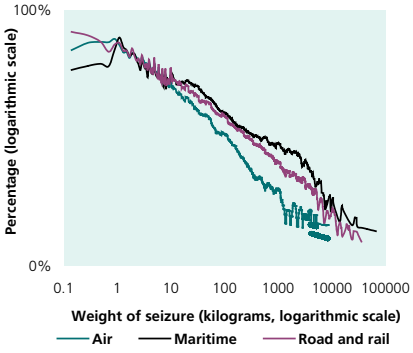
Fig. 23. Average quantity seized in individual seizure cases, by mode of transportation,[a] 1997-2011 (kilograms)



Source: United Nations Office on Drugs and Crime, individual drug seizure database.

[a] Excludes cases in which the mode of transportation was unknown, not applicable or specified as "other"

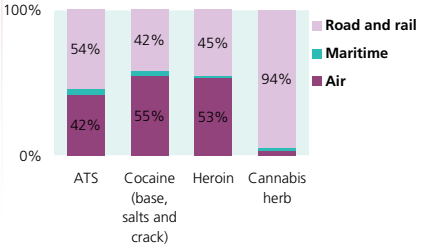
Fig. 24. Frequency distributions of quantities[a] seized in reported individual drug seizure cases, 1997-2011, by mode of transportation



Source: United Nations Office on Drugs and Crime, individual drug seizure database.

[a] Quantities of less than 100 grams are excluded.

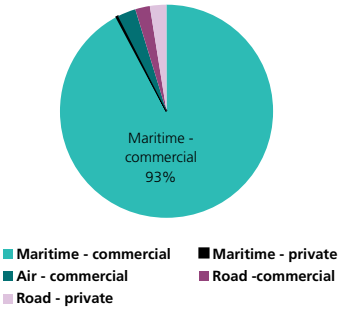
Fig. 25. Distribution of number of individual drug seizures by drug type and mode of transportation,[a] 2007-2011



Source: United Nations Office on Drugs and Crime, individual drug seizure database.

[a] Excludes cases where the mode of transportation was unknown, not applicable or specified as "other".

Fig. 26. Distribution of significant cannabis resin seizures reported by Spain, by mode of transportation,[a] 2007-2011



Source: United Nations Office on Drugs and Crime, individual drug seizure database.

[a] Excludes cases in which the mode of transportation was unknown, not applicable or specified as "other".

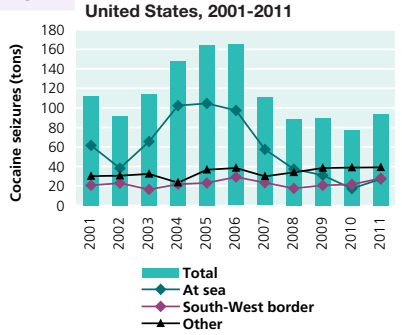
approximately 330 kg, the average quantity seized in a single maritime seizure is by far the highest among the three modes of transportation. Seized drugs trafficked by air account for more than a third of cases, but for the smallest average quantity per case.

In terms of maximizing the impact of seizures on the flow and availability of illicit drugs, this may warrant an intensified focus of interdiction efforts on maritime trafficking.

Examining different drug types separately, cases of maritime trafficking comprise a limited percentage of the total number of seizures in each of the drug categories A notable contrast is seizures of cannabis resin made by Spain, most of which (93 per cent over the period 2007-2011, excluding cases in which the mode of transportation was not specified, not applicable or specified as "other") were categorized as commercial maritime seizures. These seizures reflect trafficking of cannabis resin from Morocco on sea vessels to Spain, which constitutes a major consumer market for cannabis resin in itself but is also used as a gateway to the broader market of Western and Central Europe.

Seizures made by air account for a majority of seized consignments of cocaine and heroin, and slightly less than a majority of seizures in the case of ATS (see figure 25). In contrast, only about 3 per cent of seized consignments of cannabis herb are made as the drugs are being transported by air, with the difference being made up by seizures of consignments being transported by road and rail. This may be due to the more localized nature of trafficking patterns for cannabis herb, which is produced nearly everywhere in the world, with the result that demand can often be met by local supply.

Fig. 27. Breakdown of cocaine seizures in the United States, 2001-2011



Source: United States, Office of National Drug Control Policy.

Trafficking hubs

Pakistan, which has long been an important hub for heroin trafficking for a number of geographic reasons,[47] may be seeing the development of other routes and modes of transportation, including maritime shipping.

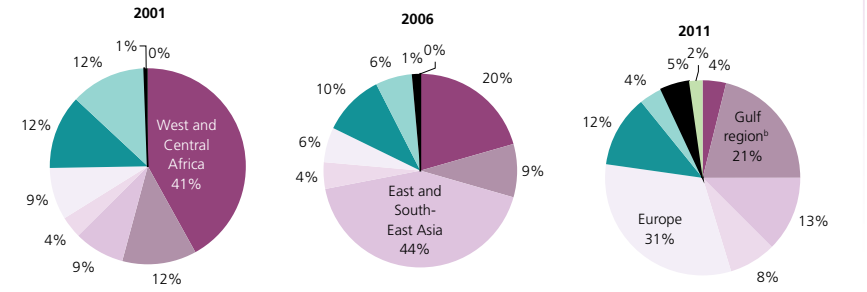
While a significant proportion of individual drug seizures reported by Pakistan, and the majority of heroin seizures, continue to be accounted for by air traffic, the destinations for trafficking by air have undergone significant shifts over time. While West and Central Africa accounted for the dominant portion in 2001, East and South-East Asia took over that role around 2006. By 2011, the proportion intended for West and Central Africa had declined to 4 per cent. This does not imply that the importance of this subregion declined, but may be an indication that trafficking by air directly from Pakistan to West Africa has been supplanted by other methods of transportation, including maritime shipments.

The rather abrupt increase in the share of East and South-East Asia marked the first inroads made by traffickers of Afghan-sourced heroin into consumer markets, notably China, previously supplied predominantly by heroin from South-East Asia. By 2011, Europe and the Gulf region had also gained prominence.[48] The United Kingdom reported a substantial rise in seizures of heroin trafficked directly from Pakistan, which accounted for nearly two thirds of heroin seized at the border (including airports and seaports) in late 2010 and early 2011. However, it was unclear whether this reflected a shift in the market of the United Kingdom or improved intelligence flows.

In 2010, 2011 and 2012, in contrast with earlier years, Pakistan reported several large maritime seizures of heroin, intended mainly for West Africa and Europe (see figure 29).

One possible factor driving this apparent change may be the disruption of the flow of heroin along the well-established Balkan route, which goes through Iran (Islamic Republic of) and Turkey. This may have spurred the development of alternative maritime routes which use Africa and some Gulf States as staging posts for trafficking to the European market. A concomitant reason could possibly be reduced demand from the European market and a consequent search for new routes and new consumer markets to supplant the declining share of Europe. In any case, the significance of this statistic should be seen in perspective, as it could also be a reflection of changes in law enforcement strategy; moreover, the increasing trend in the quantity seized in maritime cases by Pakistan is based on a limited number of seizure cases.

Fig. 28. Intended destinations[a] of consignments trafficked by air seized in Pakistan (all drugs), 2001, 2006 and 2011

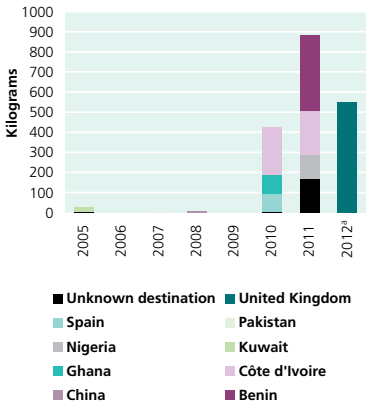


Source: United Nations Office on Drugs and Crime, individual drug seizure database.
[a] Excludes cases in which the destination was Pakistan itself or was not specified.
b Includes Bahrain, Kuwait, Qatar, Oman, Saudi Arabia and the United Arab Emirates.

47 The country shares a long border with Afghanistan and affords several advantages for traffickers from a logistical aspect, including a long coast granting access to the Indian Ocean, flexible options for air travel to key destinations and strong ties with the United Kingdom.

48 Includes Bahrain, Kuwait, Qatar, Oman, Saudi Arabia and the United Arab Emirates. However, not all of these countries appear as a destination in each of the following years: 2001, 2006 and 2011.

Fig. 29. Total quantity seized in individual maritime heroin seizures reported by Pakistan, 2005-2012[a]



Source: United Nations Office on Drugs and Crime, individual drug seizure database.
[a] Data for 2012 refers to the first quarter (January to March) only.

East Africa has long been known to function as a point of entry for heroin entering the African continent, intended most notably for South Africa and trafficked through countries on the East African and Southern African coast.[49] Some indicators suggest that this role may be assuming increasing importance and expanding to other drug types and other destinations. Comparing seizure totals for the 2010-2011 biennium with the preceding one reveals an increase in each of the drug categories, which may reflect increased trafficking into and through this subregion. However, given the limited coverage of data in this subregion and the fact that the data are driven by the quantities seized in a small number of countries, the possibility that these increases are partly the result of intensified law enforcement efforts cannot be excluded.

According to Kenyan authorities,[50] Kenya was a transit country for heroin trafficked to Europe and the United States. The heroin could be traced back to both India and Pakistan, was observed to enter Kenya by sea and air and was re-exported to other markets, either directly to Europe or via West Africa. Ethiopia was identified as a transit country for heroin in 2011 by both Nigeria and Thailand, the latter of which has had its heroin market supplied mainly from South-East and South-West Asia via more direct routes.

49 See, for example, country report by South Africa, presented at the Seventeenth Meeting of Heads of National Drug Law Enforcement Agencies, Africa, Nairobi, 17-21 September 2007.

50 Country report by Kenya, presented at the Twenty-second Meeting of Heads of National Drug Law Enforcement Agencies, Africa, Accra, 25-29 June 2012.

West Africa remains vulnerable

West Africa continues to be a region of particular concern in the global drug phenomenon; it is facing the threat of organized crime, including drug trafficking, which may in turn have a spillover effect on the extent of drug use.

There is evidence that, by 2000, significant numbers of consignments of heroin originating in Afghanistan were being trafficked via Pakistan to West and Central Africa, mainly by air. In many cases, heroin was further trafficked to other consumer markets. By 2007, West Africa had assumed an important role as a hub for cocaine on its way from South America to Western and Central Europe. In the case of both cocaine and heroin, trafficking activities may have contributed to a supply-driven increase in use, notably in Nigeria, where the annual prevalence rate is believed to be significantly higher than the global average. The number of cocaine users in West and Central Africa is estimated at 1.6 million (past-year use). Owing to the paucity of data, however, the uncertainty regarding this number is particularly pronounced, with a corresponding range of 570,000 to 2.4 million cocaine users. Nevertheless the prevalence rate in this subregion is likely significantly higher than the global average.

Beginning in mid-2009, high-purity crystalline methamphetamine originating in various West African countries started being seized in East Asia, with Japan, Malaysia, the Republic of Korea and Thailand being some of the main destination countries. Moreover, since 2011, five methamphetamine laboratories have been seized in Nigeria, pointing to a possible growing dimension of the problem. The profitability of the trade, coupled with low awareness of the end products of ATS and their precursors and the relative simplicity of the manufacturing processes, are some of the main reasons why West Africa remains vulnerable to the manufacture and trafficking of ATS.

Illicit drug traffic may potentially undermine progress made in African countries in the area of safety, stability, governance and socioeconomic development. Most countries in the region do not possess the required technical and financial means to respond effectively to the problems of illicit cultivation, manufacture and drug use.

In the past, West Africa has been identified as a significant trafficking hub for cocaine and heroin. More recently, there have been indications of emerging manufacture of ATS in West Africa. According to Nigerian authorities,[51] two methamphetamine laboratories were dismantled in the country between January 2011 and June 2012. Reports

51 Country report by Nigeria, presented at the Twenty-second Meeting of Heads of National Drug Law Enforcement Agencies, Africa, Accra, 25-29 June 2012.

from Thailand and Uganda also indicate trafficking of amphetamine from West Africa via Ethiopia, raising the possibility of a parallel flow of drugs between East and West Africa: heroin going west and amphetamine going east.

Other important transit countries include the Netherlands (for various drugs) and Brazil (for cocaine). Specifically for maritime trafficking, the Netherlands was also important as a country of provenance, although the transition from land to maritime transportation may not always occur at a seaport in the Netherlands. Ecuador emerges as an important hub in South America for maritime trafficking of cocaine.

C. CANNABIS MARKET

Cannabis is produced in virtually every country of the world, making it the most widely illicitly produced and consumed drug plant. Tables and maps with country data on cannabis cultivation, production and seizures can be found in Annex II.

The cannabis plant yields two main products: cannabis herb and cannabis resin. Cannabis herb, the dried flower buds of the female cannabis plant, is not only consumed in almost all countries of the world, it is produced in most of them, too. The more protracted processing of the compressed resin glands of the cannabis plant into cannabis resin is confined to far fewer countries, most of which are located in North Africa, the Near and Middle East and South-West Asia.[52]

It is difficult to estimate global levels of cannabis cultivation and production: its cultivation is largely of a localized nature, and it is often consumed in the country of production. Cannabis herb is increasingly cultivated in its main user markets in the Americas and Europe. The bulk of cannabis resin originates in Afghanistan and Morocco; there is evidence of stabilization or even a decrease in production in these countries.

Global cannabis cultivation and production

The localized and often small-scale nature of cannabis cultivation and production makes it very difficult to estimate them at the global level.[53] Likewise, few countries estimate the extent of cannabis cultivation and production; in general, data on cannabis are scarce in many regions.

The largest areas under cultivation or areas eradicated were reported by Afghanistan[54] (12,000 ha under cultivation), Mexico (12,000 ha under cultivation and 13,430 ha eradicated), and Morocco (47,500 ha under cultivation after eradication). Some countries also provided information on the number of plants or number of sites eradicated. Relating the number of plants to the size of an area is difficult as plant density can vary significantly, depending on the cultivation method and on environmental factors. Therefore, comparing plant eradication with eradicated area is difficult. An update of information available cannabis cultivation and production, as well as eradication, can be found in Annex II.

With regard to outdoor cultivation, the United States reported the largest number of plants eradicated (9.9 million), followed by the Philippines (4 million), Tajikistan (2.1 million) and Indonesia (1.8 million). With regard to indoor cultivation, by far the largest number of plants was eradicated by Netherlands (1.8 million), a major supplier of cannabis herb to the European market, the United States (0.47 million) and Belgium (0.3 million), to where a large portion of European cannabis herb production has shifted in recent years.[55]

Ukraine reported the largest number of eradicated outdoor sites (98,000), followed by the United States (23,622) and New Zealand (2,131). New Zealand, a country with high levels of cannabis use, reported a very large number of eradicated outdoor sites when compared with plants eradicated, which indicates a small average size of grow sites: the number of plants per outdoor site was 55, a much smaller average size than in, for example, the Philippines (30,663 plants per site).

The Netherlands reported the dismantling of 5,435 indoor cultivation sites. This number is comparable to the number of sites eradicated in previous years. The United States reported the dismantling of 4,721 indoor sites and a much smaller number of plants per site (98) than the Netherlands (335). The number of plants per indoor site in Belgium was reported as 349, which was about the same as in the Netherlands.

In countries with a favourable climate for outdoor cultivation (e.g. Australia and Italy), the vast majority of plants eradicated were on outdoor sites, while the opposite was true for countries such as Belgium, Hungary and the Netherlands, which have less favourable climatic conditions.

52 *World Drug Report 2012* (United Nations publication, Sales No. E.12.XI.1).

53 In the *World Drug Report 2009* (United Nations publication, Sales No. E.09.XI.12), it was estimated that the global production of cannabis herb ranged from 13,300 to 66,100 tons and the production of cannabis resin from 2,200 to 9,900 tons. The calculations were based on the minimum and maximum levels from reported cultivation and production, seizures and prevalence rates. In 2011, these indicators did not show significant changes that would justify an update of the production estimates, taking into account the large minimum and maximum levels.

54 Information from the cannabis survey conducted by the United Nations Office on Drugs and Crime and Afghanistan in Afghanistan in 2011.

55 See, for example, European Monitoring Centre for Drugs and Drug Addiction, *Cannabis Production and Markets in Europe,* EMCDDA Insights Series No. 12 (Luxembourg, Office for Official Publications of the European Union, 2012).

Cannabis resin production: a look at the two main source countries

In 2011, the main countries mentioned as a source country of cannabis resin by countries in which seizures of cannabis resin took place continued to be Morocco, followed by Afghanistan and, to a lesser extent, India, Lebanon and Pakistan (Pakistan assessed that all resin seized in its territory originated in Afghanistan). Such data must be treated carefully as they do not distinguish between transit countries and countries of origin, but the data do suggest that Afghanistan and Morocco are the two main source countries for cannabis resin.

Annex II shows a map with the geographical distribution of countries mentioning Afghanistan or Morocco as a source country for cannabis resin between 2009 and 2011, and thus may reflect the main markets for Afghan and Moroccan cannabis resin. Morocco was named as a source of trafficked cannabis resin by 17 different countries, 11 of which were in Western and Central Europe, where Morocco seems to remain the main source of cannabis resin. Afghanistan, on the other hand, was named as a source country for seized cannabis resin by its neighbouring countries and by countries further north. Countries in the Near and Middle East and in Europe also named Afghanistan as a source of cannabis resin.

The global distribution of cannabis resin seizures reflects the main source countries as well. During the period 2000-2011, global seizures of cannabis resin were dominated by Spain, which is the main entry point to Europe for Moroccan cannabis resin. In 2011, Spain accounted for 34 per cent of global seizures, Pakistan for 18 per cent and Morocco for 12 per cent.

Morocco: indications of a decrease in production

Data reported by the Government of Morocco point to an overall decrease in the production of cannabis resin since the period 2003-2005, when UNODC and the Government conducted joint surveys (in the most recent UNODC cannabis survey on Morocco, from 2005, the total area under illicit cannabis cultivation was estimated at 72,500 hectares). In 2011, the estimates provided by the Government did not change compared with those provided in 2010.

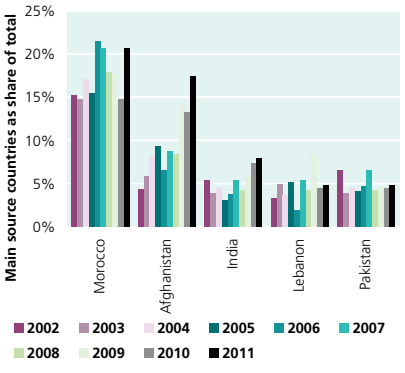
The reported decrease in production is substantiated by a decrease in seizures of both resin and kif (a dried form of cannabis that can be processed into cannabis resin) in the country. In 2011, 138 tons of kif were seized, which was less than in 2009 (223 tons) and 2010 (186 tons). Seizures of cannabis resin by Moroccan authorities increased slightly, from 119 tons in 2010 to 126 tons in 2011, but that followed a large decline from a peak of 188 tons in 2009. In 2010, Moroccan authorities attributed the decline in seizures to increased law enforcement efforts to counter cultivation within the country and to counter trafficking along the country's borders.

Likewise, the quantities of cannabis resin seized in Spain fell for the third consecutive year and Spanish authorities noted that the quantities seized had been decreasing overall. In 2011, seizures amounted to 356 tons (compared to 384 tons in 2010 and 445 tons in 2009).

Afghanistan: signs of stabilization

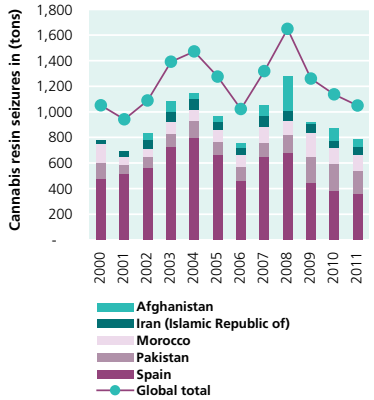
In 2011, the Government of Afghanistan and UNODC jointly carried out the third survey on cannabis cultivation

Fig. 30. Main source countries of cannabis resin, as reported by Member States, 2002-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

Fig. 31. Cannabis resin seizures, global total and selected countries, 2000-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

in Afghanistan. The survey found that cultivation of cannabis plant and production of cannabis resin in Afghanistan appeared stable, and that there was no evidence of a substantive change in comparison with the previous cannabis surveys, which had taken place in 2009 and 2010.

Cannabis in Afghanistan is a very attractive cash crop. However, the volume of cannabis cultivated is much lower than that of opium poppy (12,000 hectares of cannabis were cultivated in 2011, compared with 131,000 hectares of opium poppy), and it is cultivated less frequently: the majority of farmers who grow it do so every other year, and some even less often. The cultivation of cannabis in Afghanistan thus appears to be self-limiting.[56] However, since strong links exist between opium poppy and cannabis cultivation[57] and since there is a large pool of farmers who occasionally cultivate cannabis on a commercial basis, there may be significant potential for the substitution of cannabis for opium poppy, if opium poppy cultivation were to become less attractive.

Cannabis herb: increasing cultivation in the main markets

The region with the largest reported share of seizures of cannabis herb is by far North America, with the bulk of global seizures taking place in the United States and Mexico. North America accounted for 69 per cent of global herb seizures in 2011.

In Latin America and the Caribbean, the region with the second largest amount of seizures, most countries observed an increase in seizures, with Bolivia (Plurinational State of), Colombia and Paraguay reporting an increase of more than 100 per cent when comparing the period 2002-2006 with the period 2007-2011. Data are scarce for many African countries; however, seizures in West, Central and Southern Africa have been decreasing over the past decade. There have been increased seizures of cannabis herb in North Africa. Other regions present a mixed picture (see Annex II).

Domestic cultivation in the United States on the rise

In 2011, the United States reported that the availability of cannabis herb may have increased. The United States attributes this increase to sustained high levels of production in Mexico – the primary foreign source of the United States cannabis supply – and increased domestic cannabis cultivation.[58]

Since 2002, seizures in both Mexico and the United States have followed an upward trend, with a combined total of 3,033 tons seized in 2002 and 3,944 tons seized in 2011 (the total amounts seized reached their highest level – 4,655 tons – in 2010). In 2009, the amount seized in the United States exceeded the amount seized by the Mexican authorities for the first time.

The United States reported that high and increasing levels of domestic eradication could indicate increased domestic production, which is driven by high profitability and demand.[59] This is similar to what is observed in Europe, where domestically produced cannabis products seem to be increasingly replacing imported cannabis products.

In the United States, eradication of domestic indoor cannabis plants increased from 213,000 in 2002 to 462,000 in 2010; the number of domestic outdoor cannabis plants eradicated more than tripled over the same period, from 3,129,000 in 2002 to 9,867,000 in 2010.[60]

Fig. 32. Cannabis herb seizures in Mexico and the United States, 2002-2011

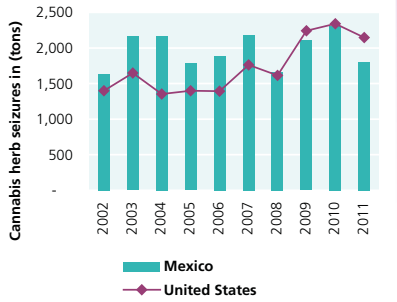
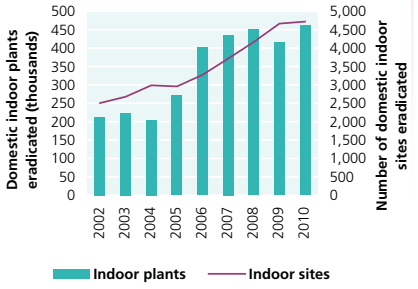


Fig. 33. Number of domestic indoor cannabis plants and sites eradicated in the United States, 2002-2010



56 United Nations Office on Drugs and Crime and Afghanistan, Ministry of Counter-Narcotics, *Survey of Commercial Cannabis Cultivation and Production 2011* (September 2012). Available from www.unodc.org/documents/crop-monitoring/Afghanistan/2011_Afghanistan_Cannabis_Survey_Report_w_cover_small.pdf.

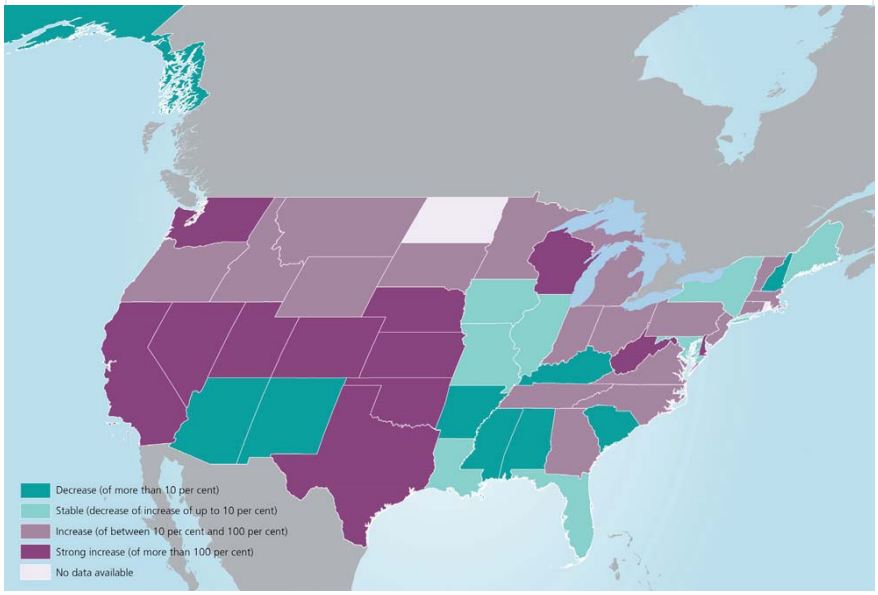
57 To a large extent, farmers who cultivate cannabis in summer also cultivate opium poppy in winter.

58 United States, Department of Justice, *National Drug Intelligence Center, National Drug Threat Assessment 2011* (August 2011).

59 United States, Department of Justice, *National Drug Intelligence*

60 United States, Executive Office of the President, Office of National Drug Control Policy, *National Drug Control Strategy: Data Supplement 2012* (Washington, D.C., 2012).

Map 3. **Cannabis plant eradication in the United States of America between the periods 2005-2007 and 2008-2010**

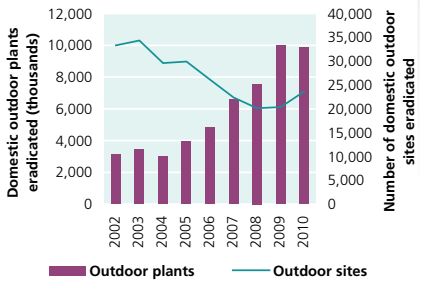


Source: UNODC, data from the annual report questionnaire and other official sources.

The number of domestic outdoor cannabis sites eradicated showed a different trend – there was an overall decrease until 2008, after which it increased again slightly. The decrease in the number of outdoor sites eradicated together with the strong increase in the number of plants eradicated indicates a larger average size of the sites that were eradicated. This could be an indication of intensive production (i.e. larger plantations with more plants) and/or a concentration of law enforcement efforts on very large grow sites.

The average size of eradicated indoor sites has not changed significantly, indicating that most large-scale cultivation occurs outdoors.

Fig. 34. **Number of domestic outdoor cannabis plants and sites eradicated in the United States, 2002-2010**



Rest of the world: increased seizures in Latin America and the Caribbean and a continuing trend towards domestically produced cannabis herb in Europe

Most countries in Latin America and the Caribbean have registered increases in seizures of cannabis herb in recent years. Three countries in Latin America (Brazil, Colombia and Paraguay) seized significant quantities of cannabis herb in 2011.

In Brazil, the number of seizure cases was roughly the same in 2010 and 2011 (885 and 878 cases, respectively), but the total amount of cannabis herb seized rose from 155 tons in 2010 to 174 tons in 2011, which was the third consecutive increase.

In Colombia, the number of seizures increased from 38,876 in 2010 to 41,291 in 2011, and the amount seized rose for the third consecutive year, from 209 tons in 2009 to 255 tons in 2010 and 321 tons in 2011. Whether this

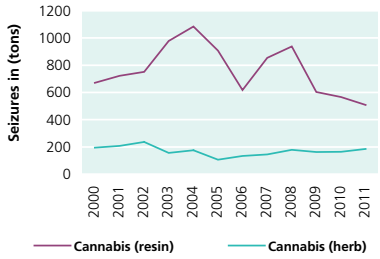
is the result of increased levels of production or increased law enforcement efforts is not clear.

In Paraguay, seizures of cannabis herb more than doubled, from 84 tons in 2009 to 171 tons in 2011 (no data are available for 2010).

In Europe, the trend towards increased seizures of cannabis herb and decreased seizures of cannabis resin continued, which may be an indication of imported resin being increasingly replaced by domestically produced cannabis. Cannabis resin seizures in the whole region decreased from 566 tons in 2010 to 503 tons in 2011. This was mainly the result of reduced seizures in Spain (decrease of 28 tons), Portugal (decrease of 20 tons) and Turkey (decrease of 8 tons). Cannabis herb seizures increased by 12 per cent, from 164 tons in 2010 to 184 tons in 2011.

Nearly all countries in Africa reported the cultivation and seizure of cannabis herb. Nigeria continued to seize the largest quantities of cannabis herb in the region, with 139 tons seized between July 2011 and April 2012.[61] The second largest annual seizure totals were in Egypt, whose authorities reported seizing 73 tons of cannabis herb in 2011, down from 107 tons in 2010. Seizures of cannabis herb in Mozambique increased from 3 tons in 2010 to 32 tons in 2011, and authorities in Burkina Faso reported seizures of 33 tons of cannabis herb in 2011, nearly double the 17 tons seized in 2009.

Fig. 35. Cannabis herb and cannabis resin seizures in Europe, 2002-2012



Source: UNODC, data from the annual report questionnaire and other official sources.

Marijuana in the United States of America

As of February 2013, 18 states of the United States of America, as well as the District of Columbia, have passed laws allowing marijuana to be used for a variety of medical conditions.[a]

Many of these states have in place, or are developing, programmes or provisions to regulate the use of medical marijuana by approved patients, as well as the cultivation, sale and possession of marijuana.[b] Under the programmes of some states, patients may be assisted by so-called caregivers, who are persons authorized to help patients grow, acquire and use the drug.[c]

In 2012, voters in two states—Colorado and Washington state—also passed initiatives legalizing the sale and recreational use of marijuana by adults, aged 21 years and older.

It is important to note that none of these state marijuana laws changes the fact that producing, selling or possessing marijuana continues to be an offence under United States Federal law.[d] The position of the United States Federal Government is that marijuana should be subjected to the same rigorous clinical trials and scientific scrutiny that are applied to all other new medications.[e]

Medical marijuana laws were passed separately on a state-by-state basis; a wide range of different policies regulating marijuana use exist. Nevada, for example, allows the possession of 1 ounce (28 grams) of usable marijuana, three mature and four immature plants.[f] Oregon permits patients to possess up to 24 ounces (672 grams) of usable marijuana and six mature plants.[g] Though most states that have decriminalized medical marijuana have also provided legal protections for its users, the majority of these laws have not established mechanisms for dispensing the drug or for regulating its quality and safety.

The definitions of what qualifies patients for medical marijuana can vary greatly among these states. New Mexico, for instance, permits the use of medical marijuana only for a limited set of conditions (including cancer, glaucoma, HIV/AIDS, epilepsy, multiple sclerosis, spinal cord damage and terminal illness).[h] California, on the other hand, has an extensive list that includes general ailments such as migraines, severe or chronic pain and "any other illness for which marijuana provides relief".[i]

61 Information contained in the country report by Nigeria presented at the Twenty-second Meeting of Heads of National Drug Law Enforcement Agencies, Africa, Accra, 25-29 June 2012.

Data on numbers of and trends among medical marijuana patients are limited by the absence of a standard method of collecting and disseminating data. Many states have a mandatory registration system of patients; in California, the most populous United States state, registration is voluntary. Only some states, such as Colorado,j provide detailed statistics online.

A recent study[k] examined a number of state medical marijuana registries as of June 2011 (in states with mandatory registration only) and highlighted some key information about those enrolled in medical marijuana programmes. The study concluded that the majority of persons registered appeared to be young, male and registered for chronic pain. There was a significant difference between states in the proportion of the adult population registered for medical marijuana, ranging from 4.1 per cent (Montana) to 0.07 per cent (Vermont). Possible explanations given for these differences were differences in disease burden, social acceptance of marijuana and ease of marijuana registration and acquisition. The study was limited by a lack of or limited data from several states.

There is an ongoing discussion on the impact of medical marijuana laws on overall levels of marijuana use and on risk perception of consumption. Several articles on that topic are listed below.

Further reading

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[a] See www.whitehouse.gov/ondcp/state-laws-related-to-marijuana (accessed February 2013).
[b] Mark Eddy, *Medical Marijuana: Review and Analysis of Federal and State Policies*, Congressional Research Service Report for Congress (2 April 2010). Available from http://assets.opencrs.com/rpts/RL33211_20100402.pdf.
[c] Ibid.
[d] See www.whitehouse.gov/ondcp/state-laws-related-to-marijuana (accessed February 2013).
[e] See www.whitehouse.gov/ondcp/frequently-asked-questions-and-facts-about-marijuana#opposed (accessed February 2013).
[f] Nevada Revised Statutes (NRS), chapter 453A, "Medical use of marijuana" (http://leg.state.nv.us/NRS/NRS-453A.html).
[g] Oregon, Senate Bill (SB) 161 (www.leg.state.or.us/07reg/measures/sb0100.dir/sb0161.en.html).
[h] New Mexico, Medical Cannabis Program (http://nmhealth.org/mcp (accessed February 2013).
[i] California, Proposition 215 (http://vote96.sos.ca.gov/bp/215text.htm (accessed February 2013)).
[j] See www.colorado.gov/cs/Satellite/CDPHE-CHEIS/CBON/1251593017044 (accessed February 2013).
[k] Daniel W. Bowles, "Persons registered for medical marijuana in the United States", Journal of Palliative Medicine, vol. 15, No. 1 (2012), pp. 9-11.

D. ILLICIT OPIATE MARKET

Overview

Afghanistan maintained its position as the lead producer and cultivator of opium globally. With a global total of over 236,000 hectares under cultivation, illicit cultivation of opium poppy reached peak levels in 2012, surpassing the 10-year high recorded in 2007. This was mainly the result of increases in Afghanistan and Myanmar (the two main producers). A preliminary assessment of opium poppy cultivation trends in Afghanistan in 2013 revealed that such cultivation is likely to increase in the main opium growing regions, which would be the third consecutive increase since 2010.[62] Mexico remained the largest grower of opium poppy in the Americas. An overview of global potential production of opium and manufacture of heroin, as well as country data on opium poppy cultivation and eradication and opium production can be found in Annex II.

The fluctuations which characterized opium production in Afghanistan in recent years, also affected Europe, the main market for opiates. Heroin use decreased in Western and Central Europe, which can be ascribed to a change in the structure of the market, which has seen decreased supply, increased law enforcement activity and an ageing user population, combined with an increase in the availability of treatment. However, the same does not apply to the non-medical use of prescription opioids.

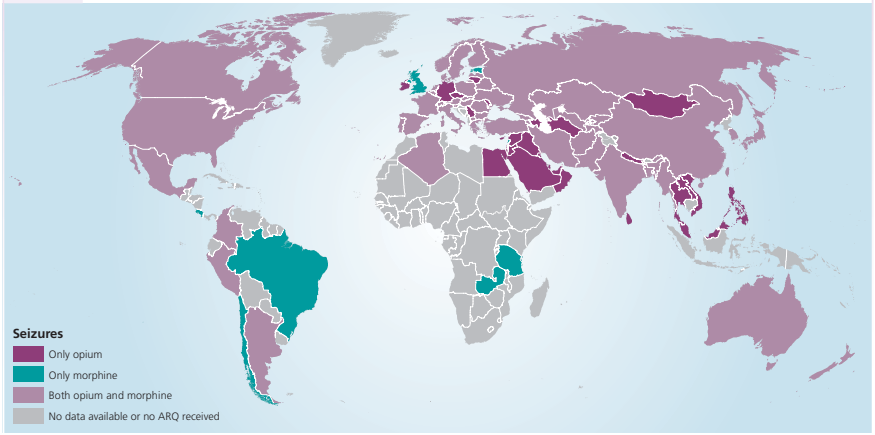
There are indications that more Afghan opiates are being trafficked on routes other than the Balkan route (which goes through Iran (Islamic Republic of) and Turkey to Europe) and the northern route (through Central Asia and the Russian Federation). As these other routes go southward from Afghanistan, either through Pakistan or through Iran (Islamic Republic of), they are known collectively as the "southern route".

East Africa may be developing into a hub for onward trafficking, with maritime trafficking playing an increasingly important role compared with trafficking by air and courier. A relatively new route has developed through the Middle East via Iraq, while a stronger flow of Afghan opiates towards East and South-East Asia has been observed. These markets have traditionally been supplied by opiates from within the subregion.

Continued inconsistency in the information available from the Americas on opiate production and flows makes an analysis of the situation difficult – while Mexico has the greater potential production of opium, it is Colombia that is reported as the main supplier of heroin to the United States. The Canadian market seems to be supplied by producers from Asia.

Typically, opium is converted into heroin in or close to the countries where opium poppy is cultivated and, by and large, seizure patterns reflect this. However, opium poppy eradication and opium and morphine seizures are reported in a wide range of countries other than the main opium-producing countries, albeit usually in comparatively small

Map 4. Opium and morphine seizures between 2007 and 2011



Source: UNODC Annual Reports Questionnaire supplemented by other sources.

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined.

62 United Nations Office on Drugs and Crime and Afghanistan, Ministry of Counter-Narcotics, "Afghanistan: opium risk assessment 2013" (April 2013).

quantities. This phenomenon should be investigated further in order to improve understanding of the global scope of the opiates market.

Revision of opium production estimates in Afghanistan for the period 2006-2009

UNODC has undertaken an exercise to improve the quality of data on opium production in Afghanistan, a process that has also led to a re-examination of the estimates for the period 2006-2009, which were consequently revised downwards.

Survey work and its supervision in the field have become increasingly difficult, in part owing to the deteriorating security situation in the main opium poppy-growing areas in the south of Afghanistan, coupled with a dramatic increase in poppy cultivation and the size of the area surveyed after 2005. It has become more and more difficult for surveyors to comply with the opium yield survey protocol, which is designed for data collection on the ground.

UNODC sought expert advice and undertook an extensive study that led to the development of statistical tests for gauging the reliability of opium yield survey data.[63] After successfully establishing procedures for quality control, opium yield data for the period 2006-2009, a particularly challenging period, were reviewed, which resulted in a downward revision of the yield estimates and a corresponding decrease in the opium production estimates. The revision did not, however, have an impact on production trends in those years, nor did it change Afghanistan's position as the world's leading producer of opium.[64]

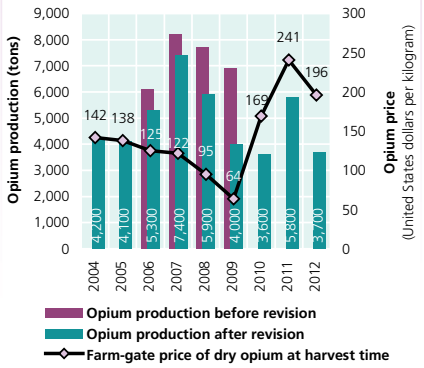
Despite the downward revision, the level of opium production in Afghanistan in 2007, 2008 and 2011 can be considered to be exceptionally high. Years with relatively low levels of production, such as 2009, 2010 and 2012, reduced the assumed "overproduction" in those years.

This could explain why farm-gate opium prices in Afghanistan rose rapidly after mid-2009 (the first year with a comparatively low harvest after several years of record production), from only $64 per kilogram to $169 per kilogram after the 2010 harvest failed, owing to weather conditions and plant disease. After a relatively high level of opium production in 2011, prices went down but remained at a much higher level than before 2010, as the 2012 opium harvest turned out to be below average. In 2012, due to a combination of disease of opium poppy and adverse weather conditions, opium production in Afghanistan was estimated at only 3,700 tons, 36% less than in 2011.

63 See United Nations Office on Drugs and Crime and Afghanistan, Ministry of Counter-Narcotics, *Afghanistan: Opium Survey 2011* (December 2011), pp. 95-97.

64 For a detailed description of the revision see United Nations Office on Drugs and Crime and Afghanistan, Ministry of Counter-Narcotics, *Afghanistan: Opium Survey 2012* (May 2013), chapter 7.3.

Fig. 36. Opium production estimates in Afghanistan before and after revision, and farm-gate prices of dry opium, 2004 to 2012



Source: United Nations Office on Drugs and Crime and Afghanistan, Ministry of Counter-Narcotics, *Afghanistan: Opium Survey 2011* (December 2011), pp. 95-97.

However, production fluctuations alone do not explain why opium prices rebounded so strongly after 2010 and remained at a high level of about $200 per kilogram, even after a relatively good harvest in 2011. Other factors, such as changes in trafficking flow, demand or law enforcement, are likely to have played a role, and need to be further investigated.

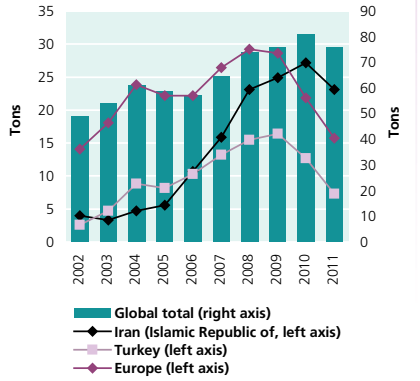
Effect of fluctuations in global opiate production on major markets

Structural changes in the European heroin market

The fluctuation in Afghan opium production affected the European market, which has seen decreased supply, owing in part to successful law enforcement activity, as well as to changes in trafficking flows. Heroin seizures have also decreased in Europe since 2009. In Western and Central Europe, greater access to treatment and alternatives to heroin, along with relatively smaller numbers of new heroin users, have contributed to a change in the structure of the European heroin market. While the decreased heroin supply also affected Eastern and South-Eastern Europe, structural changes on the demand side to the extent observed in Western and Central Europe were not reported in those subregions.

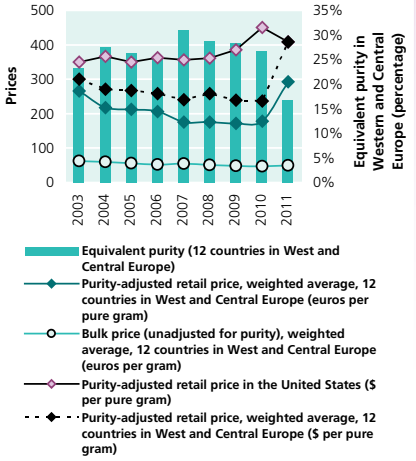
Increased law enforcement activity, as reflected in the figures for global heroin seizures, also affected the supply to Europe, where heroin seizures declined by 28 per cent in 2011 to 16 tons, only half the amount seized in 2008 (29 tons). A decline was also noticed in heroin seizures in the Islamic Republic of Iran (by 15 per cent to 23 tons) and

Fig. 37. Heroin seizures worldwide, in Europe and in selected countries, 2002-2011
(Tons)



Source: UNODC, data from annual report questionnaire and other official sources.

Fig. 38. Heroin retail prices in the United States and Western and Central Europe, 2003-2011



Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire; Europol; and the United States Office of National Drug Control Policy.

Turkey (by 43 per cent to 7 tons) in 2011, two countries on the Balkan route through which Afghan opiates reach Europe.

Interestingly, heroin seizures had already started to decline in 2010 in Turkey and South-East Europe, despite the fact that they are further along the trafficking route than the Islamic Republic of Iran.

EMCDDA argues that the decline in seizures reported in Turkey and the European Union in 2010 and 2011 could be a result of changes in both trafficking flows and law enforcement activity.[65]

The assumption that changes in production levels and in law enforcement activity did indeed lead to changes in the volume of drug flow is also supported by purity figures from Western and Central European countries. In Germany, for example, a clear decline in heroin purity was seen: it was 34.1 per cent at the wholesale level in 2010, having increased steadily from 36.5 per cent in 2005 to 60.3 per cent in 2009.[66] The retail level followed a similar pattern from 2005, but reflected the decline in purity one year later, when it fell from 25 per cent in 2010 to only 11 per cent in 2011. Such drops in purity are often associated with the diminished availability of the drug in user markets: traffickers cut the drug with more adulterants or cutting agents to maintain their previous sales volumes.

Changes on the demand side have also contributed to a lesser flow of opiates towards Europe. Drug treatment and use indicators suggest that the heroin market, particularly in Western and Central Europe, is undergoing a structural change. Heroin users have a relatively high level of service contact and access to opioid substitution therapy or alternatives to heroin.[67] These alternative substances may also be obtained illicitly. In Estonia, for example, heroin users are reported to be using illicit synthetic opioids (fentanyl). Greece, Italy, Latvia, the Russian Federation, Slovakia and Switzerland all reported seizures of 1 kg or more of prescription and other opioids in 2011,[68] indicating that this phenomenon is not restricted to Western and Central Europe.

All these factors – substitution strategies, treatment and low levels of new use – represent a combination of long-term structural changes in the user population and short-term adaptive use strategies. They shed some light on how the heroin user population, particularly in Western and Central Europe, could react to supply fluctuations and a reduced flow of opiates into the region. The heroin seizures reported for 2011 in Western and Central Europe, which are at about the 2010 level, indicate that these changes and strategies, however, may not necessarily continue.

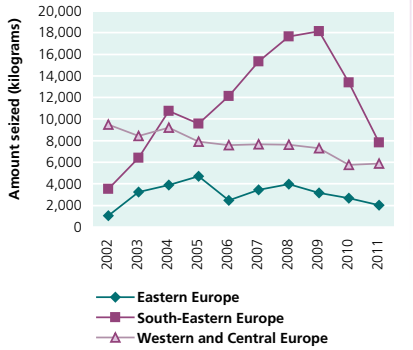
65 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis* (Luxembourg, Publications Office of the European Union, 2013), p. 30.

66 Tim Pfeiffer-Gerschel and others, *2012 National Report to the EMCDDA by the Reitox National Focal Point: Germany – New Developments, Trends and In-Depth Information on Selected Issues* (Deutsche Beobachtungsstelle für Drogen und Drogensucht, 2012), p. 190.

67 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe*, p. 73.

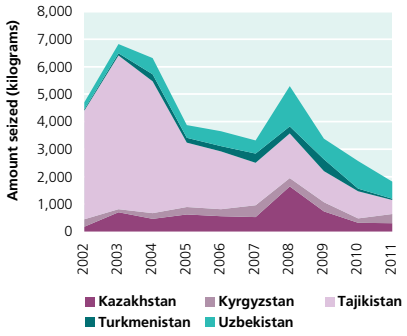
68 Annual report questionnaire replies for 2011.

Fig. 39. Heroin seizures in Europe, 2002-2011



Source: UNODC, data from annual report questionnaire and other official sources.

Fig. 40. Heroin seizures in Central Asia by country, 2002-2011



Source: UNODC, data from annual report questionnaire and other official sources.

The northern route, which is used mainly to supply the heroin market in Central Asia and the Russian Federation, reflects a different pattern. Overall, heroin seizures in Central Asia have been declining since the first decade of the twenty-first century, from an annual average of 5 tons per year during the period 2002-2006 to only 3 tons during the period 2007-2011, while demand in Central Asia and the Russian Federation is thought to be stable or increasing. The small peak in seizures in 2008 seems to reflect the high opium production in Afghanistan in that and the preceding year but did not change the overall declining trend. The link between production in Afghanistan and seizure levels in Central Asia is not evident and other factors are assumed to have played a role.

Changing patterns: increase in maritime trafficking to Africa

A strong increase in heroin seizures has been observed in Africa, especially in East Africa, since 2009. The amount of heroin seized in East, West and Central Africa remains small compared with those in other regions, but from 2009, they increased over fivefold. The vast majority of these seizures were made at sea borders or ports or on the open sea, which points to increased maritime trafficking of Afghan opiates towards Africa. Data on recent seizures made at sea borders, at ports or at sea suggest that large volumes are trafficked along this route: in a single case in April 2011, 202 kg of heroin was seized in Benin[69] as part of a controlled delivery operation conducted by the Governments of Benin and Pakistan and, in January 2012, 210 kg of heroin that had been trafficked via a maritime route was seized in the United Republic of Tanzania.[70]

Data from heroin seizures reported in East Africa between 2010 and 2012 suggest that heroin is trafficked towards the sea borders and ports of Kenya and the United Republic of Tanzania. Later on, it is transported towards South Africa by road. Anecdotal information reveals that traffickers use a number of vessels to traffic opiates from ports in Iran (Islamic Republic of) and Pakistan to Africa. Dhows and, to a lesser extent, containers are used to reach East Africa, while containers are used more to reach West Africa, particularly Benin and Nigeria.

Emerging routes through the Middle East

Iraq and the Middle East may be emerging as new trafficking routes: an increasing number of countries are reporting seizures of heroin sourced from Afghanistan. Whether that also indicates an increase in heroin abuse in the region remains to be seen. It is also noteworthy that between 2006 and 2011, most Pakistani traffickers arrested in Pakistan were headed for destinations in the Gulf States or in China, Malaysia and Thailand.

There are reports that strengthened law enforcement countermeasures on the border between the Islamic Republic of Iran and Turkey might have led to new trafficking routes emerging in Iraq.[71] In 2011, Turkish law enforcement authorities reported three operations linked to heroin trafficking through the north of Iraq that resulted in seizures of 550 kg of the drug.[72] Both heroin and opium are trafficked through Iraq. Canadian authorities reported seizures

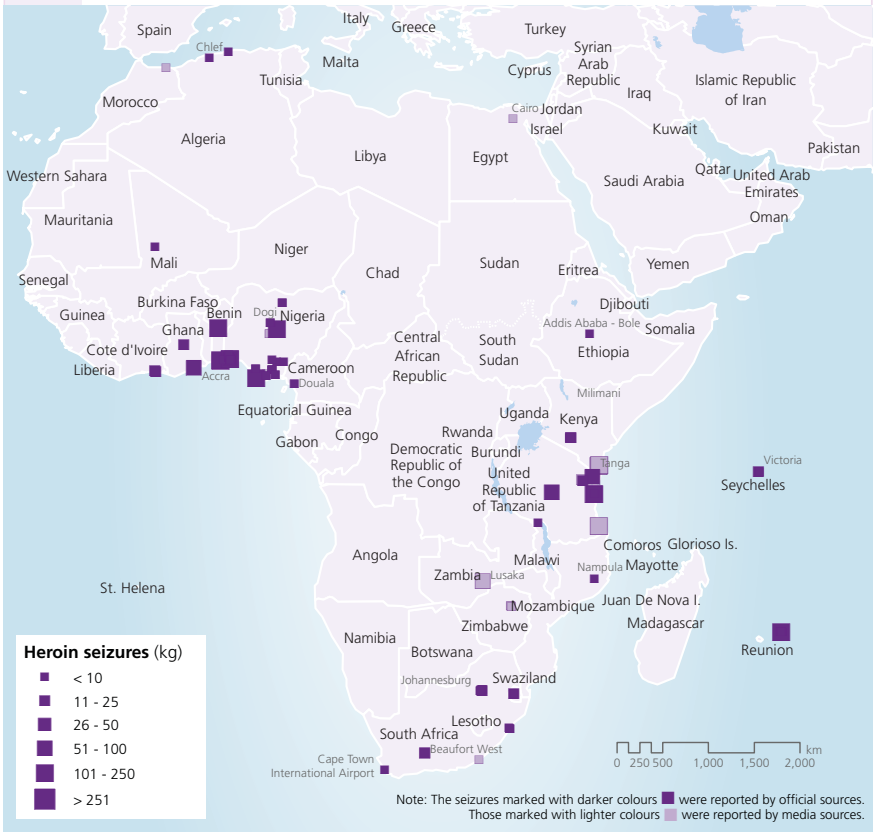
69 United Nations Office on Drugs and Crime, *Paris Pact Drug Situation Report: Trafficking in Opiates Originating in Afghanistan* (March 2013).

70 Annual report questionnaire.

71 Report of the Subcommission on Illicit Drug Traffic and Related Matters in the Near and Middle East on its forty-seventh session, held in Antalya, Turkey, from 19 to 23 November 2012 (UNODC/SUBCOM/47/5).

72 "The new patterns of drug trafficking in Turkey", presentation prepared by the Turkish Central Narcotics Division for the international conference entitled "Criminal drug organizations: situation in EU with special focus on the Balkans", Ohrid, the former Yugoslav Republic of Macedonia, October 2012.

Map 5. Locations of reported heroin seizures in Africa for the period 2010-2012



Source: UNODC data from the individual seizures database and UNODC Regional Office for Central Asia, mapping of drug seizures online.

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. The final boundary between the Sudan and South Sudan has not yet been determined.

of opium trafficked by air from Iraq to Canada during the period 2009-2012, including a single 10 kg shipment hidden in car parts.[73]

Many countries in the Middle East, including Saudi Arabia and the Syrian Arab Republic, have reported increases in opiate seizures to UNODC. Heroin seizures reported by the Syrian Arab Republic were, on average, over 80 kg during the period 2007 to 2011, compared with only 14 kg in the preceding five-year period; the quantity of heroin seized in Saudi Arabia has also increased since 2007, from an average of 1 kg during the period 2002-2007 to 41 kg in 2008, 56 kg in 2010 and 111 kg in 2011.[74] Lack of data makes it difficult to define whether these increases imply an increase in heroin use in the region, or whether traffickers are seeking alternative routes (notably to Europe).

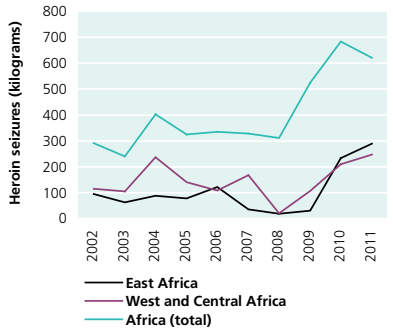
Finally, large shipments of heroin being trafficked in containers have been seized in the United Arab Emirates, which is a key node with major ports in Dubai, Khawr Fakkan and Abu Dhabi. Trade flow through harbours in the country may be exploited by drug traffickers for their illicit trade. In 2011, Dubai authorities seized 130 kg of heroin en route from Pakistan.[75]

73 Canada Border Services Agency, "CBSA finds 10 kilos of suspected opium concealed in steel gear", 24 February 2012 (www.cbsa-asfc.gc.ca/media/prosecutions-poursuites/tor/2012-02-24-eng.html).

74 UNODC annual report questionnaire.

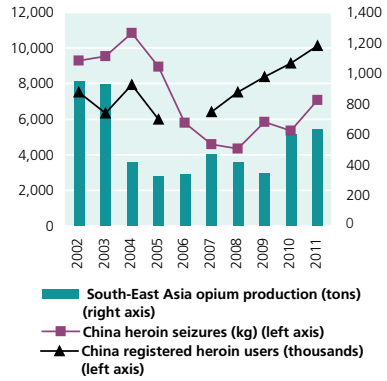
75 United Nations Office on Drugs and Crime and World Customs Organization, "UNODC-WCO Container Control Programme: year-

Fig. 41. Heroin seizures in Africa, 2002-2011



Source: UNODC, data from annual report questionnaire and other official sources and the World Customs Organization.

Fig. 42. Opium production in South-East Asia and heroin seizures and use in China, 2002-2011



Source: UNODC, data from annual report questionnaire and other official sources.

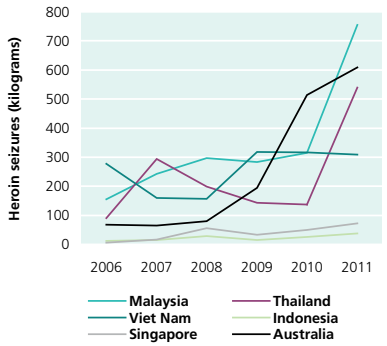
Against the trend? The heroin market in East and South-East Asia

The pattern of heroin seizures in East and South-East Asia is quite different to that in Europe. The number of registered heroin users in China is increasing and it appears that opium production in the Lao People's Democratic Republic and Myanmar is unable to meet demand. This would indicate that other sources, possibly Afghanistan, are supplying the country with opiates.

Seizure trends in China generally follow opium production trends in South-East Asia. Heroin seizures in China reached their lowest levels in 2007 and 2008, which ties in with the low levels of opium production seen in the Lao People's Democratic Republic and Myanmar during the period 2005-2006 (factoring in the one-year time lag between the production and seizure of the drug). Subsequently, heroin seizures rose again, following increases in opium production in South-East Asia. However, the number of registered heroin users was much higher than in the first half of the decade, when production levels and seizure levels in South-East Asia were much lower. This could indicate the growing importance of other source regions for the Chinese opiate market, in particular Afghanistan, which registered record harvests in some years when opium production in South-East Asia was low.

This indicates a diversification of source regions and thus trafficking routes, which include maritime and courier routes, possibly taking advantage of growing licit trade flows between China and South-West Asia.[76] China reports

Fig. 43. Heroin seizures in selected countries in South-East Asia and Oceania, 2006-2011 (Kilograms)



Source: UNODC, data from annual report questionnaire and other official sources.

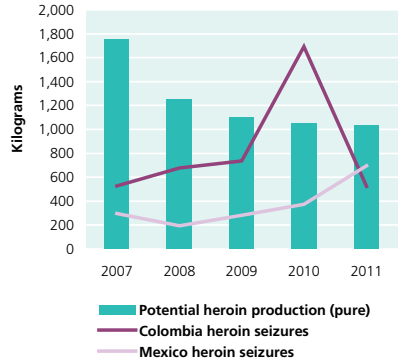
Malaysia as the second leading country, after Myanmar, from which drugs enter the country, and lists Afghanistan as the second leading source country for opiates entering the country. As the opium production areas in Myanmar border China and there is little need to resort to other trafficking routes, it is not unlikely that Afghan opiates enter China through regional hubs in Malaysia and Thailand via couriers; this is confirmed by statistics from Malaysia and Pakistan.[77]

end report 2011", p. 11 (available from www.unodc.org/documents/toc/CCP_Year_End_Report_2011.pdf).

76 For more information on this issue, see United Nations Office on Drugs and Crime, *Misuse of Licit Trade for Opiate Trafficking in Western and Central Asia: A Threat Assessment* (October 2012). More research is needed to get a better understanding of misuse of licit trade for drug trafficking in China and South-East Asia.

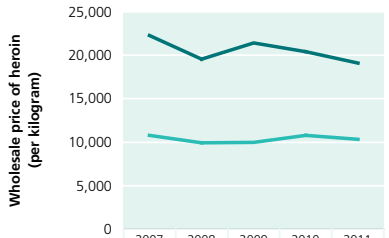
77 Annual report questionnaire replies submitted by Malaysia and Pakistan for 2011.

Fig. 44. Potential heroin production in Colombia and seizures in Colombia and Mexico, 2007-2011



Source: UNODC, data from annual report questionnaire and other official sources and Illicit Crop Monitoring Programme.

Fig. 45. Colombia, annual wholesale price of heroin, 2007 to 2011



	2007	2008	2009	2010	2011
Heroin (wholesale), Colombian pesos per kg (thousands)	22,294	19,560	21,422	20,421	19,101
Heroin (wholesale), United States dollars per kg	10,780	9,950	9,993	10,786	10,348

Source: United Nations Office on Drugs and Crime and Colombia, *Colombia: Coca Cultivation Survey 2011* (June 2012).

The rising levels of heroin seizures in several countries in South-East Asia and Oceania supports the assumption of a growing opiate flow through these regions to known consumer markets such as China and Australia. Owing to a lack of drug use statistics in many South-East Asian countries, it is difficult to assess whether and how this development affects opiate use in those countries.

Problems identifying opiate flows in the Americas

All countries in the Americas, except Canada, are supplied by heroin produced in the region. According to Government reports, the Canadian heroin market is supplied by heroin originating in Asia, mainly Afghanistan. Middle Eastern and Asian organized criminal groups both within Canada and abroad continued to be involved in the smuggling of heroin intended for Canada.[78]

The available information on heroin production in Colombia and Mexico, two important supply countries for the United States market, is inconsistent and does not fully explain the heroin supply situation in the region, given that the potential cultivation is greater in Mexico, while the United States reports Colombia as its main supplier.[79] There is insufficient information about the role played by heroin originating in Afghanistan for the United States market.

In Colombia, between 2007 and 2011, 4 tons of heroin of unknown purity was seized, while potential production amounted to 6 tons of pure heroin. In 2010, the amount of heroin (of unknown quality) seized was even larger than the amount of potential production in the country. Allowing for lower purity of the seized heroin, this would indicate a very high seizure rate, which would leave only a small amount of heroin for local consumption and export. Though, with an annual prevalence of only 0.02 per cent among those aged 15-64 years, opiates are not widely used in the country, and the number of estimated opiate users is around 6,000.

Official data show a strong decline in opium and heroin production in Colombia over the period 1998-2007 and further declines to 2011. However, heroin prices did not increase. Nominal prices for heroin at the wholesale level were lower in 2011 in both dollars and Colombian pesos, than they were five years before, suggesting that the supply of heroin did not drastically diminish.

In comparison, in Mexico, potential heroin production is estimated to be 30 times higher than in Colombia, and heroin seizures reached the Colombian level in 2011. Despite this, and while acknowledging the growing importance of Mexico as a supply country for heroin reaching its market, the United States – on the basis of information from its Heroin Signature Program – continues to consider Colombia the primary source of heroin in the country,[80] although heroin from South-West Asia continues to be available. The United States estimates poppy cultivation

78 Annual report questionnaire replies submitted by Canada for 2011.

79 Annual report questionnaire replies submitted by the United States for 2011.

80 Levamisole and tetramisole were mentioned as cutting agents used in heroin available in the United States (annual report questionnaire replies submitted by the United States for 2011). These substances are known to be used in cocaine manufacture in Colombia, where they are added to export-ready cocaine in clandestine laboratories.

in Mexico at 12,000 hectares,[81] with a correspondingly higher potential production of heroin.[82]

It is unclear how Colombia, given its much lower potential production, could supply larger amounts to the United States market than Mexico. This points to heroin production in Colombia having a greater degree of importance than that reflected in the available potential production estimates, and/or different interpretations could be drawn from the United States Heroin Signature Program, since "investigative reporting suggests that heroin producers in Mexico maybe using Colombian processing techniques".[83]

E. COCAINE MARKET

Global trends in the main supply indicators

Most indicators, including cultivation of coca bush, manufacture of cocaine, seizures of cocaine and prevalence estimates in the major consumer countries, suggest that in recent years the cocaine market has, on the whole, been declining. This finding primarily reflects the situation in North America, where the cocaine market declined significantly over the period 2006-2012, and, to a lesser extent, in Western and Central Europe, where the cocaine market appears to have stabilized following many years of growth.

In contrast, over the past decade the prevalence of cocaine use appears to have increased in several regions with large populations, notably South America, but also, to a lesser extent, Africa and Asia. Globally, this has resulted in a shift in the demand for cocaine. Moreover, several regions not previously associated with large-scale use of or trafficking in cocaine have shown signs of emerging as markets for cocaine. There is no certainty that cocaine use will remain concentrated in the Americas, Europe and Oceania. In Africa and Asia, which account for the majority of the world's population, the prevalence rate of cocaine use, while still low, holds the potential to grow. In the long term, the growth in global population maybe a major driving force in setting the trend for global demand.

Cultivation, production and manufacture of cocaine

Global illicit cultivation of coca bush in 2011 remained at around the same level as in 2010. Despite the uncertainty in estimates of cocaine manufacture, the same can be assumed for global cocaine manufacture. An overview of global illicit cultivation of coca bush, potential production of coca leaf and potential manufacture of cocaine can be found in Annex II.

After several years of increases since 2005, the Plurinational State of Bolivia saw a decrease in coca bush cultivation of 12 per cent in 2011. The decrease took place in all three growing areas (the Yungas of La Paz, the Cochabamba Tropics (Chapare) and Apolo) and was attributed to efforts by the Government to eradicate coca bushes, specifically in national parks and other areas where the Government prohibits coca bush cultivation, and to achieve a reduction of such cultivation through so-called rationalization – a voluntary reduction negotiated with coca farmers in areas where national laws allow and regulate coca bush cultivation.

Colombia and Peru, on the other hand, experienced small increases in the area under coca bush cultivation. However, the small nominal increase in area in Colombia should be interpreted with caution, as a determination of whether the 2011 figure was statistically different from 2010 cannot be made under the applied methodology. In Colombia, cocaine manufacture was estimated to be slightly lower in 2011 than in 2010, as the per-hectare yield decreased from 4.6 tons of fresh coca leaf per year in 2010 to 4.2 tons in 2011 and, as a result, total production of fresh coca leaf decreased by 14 per cent to 263,800 tons in 2011.

For the first time, an estimate of coca bush cultivation in Peru with the reference date of 31 December is presented to improve the comparability of cultivation figures among countries.[84] This estimate takes into account eradication that happened after the acquisition of satellite imagery, the main data source for the coca area estimate, and the end of the survey year. It represents the net area under coca bush cultivation on 31 December in Peru (62,500 ha) and is lower than the estimates interpreted from satellite imagery collected in the preceding months (64,400 ha).

Since the net area under coca bush cultivation on 31 December is a concept also used by Colombia, this development improves the comparability of estimates between the two countries. However, for comparisons with past years the previously published estimated area interpreted from satellite imagery was used for the global coca bush cultivation estimate to maintain consistency in the historical series of estimates.

A comparison of the long-term trends in cultivation of coca bush and manufacture of cocaine suggests that the noticeable decline in the total area under cultivation that occurred between 2001 and 2003, which essentially determined a transition between two relatively stable periods (before and after 2002), was offset by an increase in efficiency in the manufacturing chain from coca bush to cocaine hydrochloride. Indeed, while the estimated total

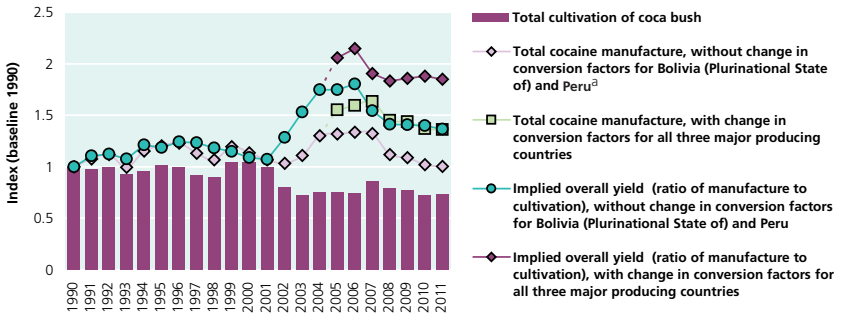
81 *International Narcotics Control Strategy Report*, vol. 1, *Drug and Chemical Control*.

82 The Government of Mexico does not validate the estimates provided by the United States of America, as they are not part of its official figures and it does not have information on the methodology used to calculate them. The Government of Mexico is in the process of implementing a monitoring system in collaboration with UNODC to estimate illicit cultivation and production.

83 National Drug Intelligence Center of the U.S. Department of Justice. *2011 National Drug Threat Assessment*, p.27.

84 For a discussion of different area concepts and the effect of eradication on comparability see *World Drug Report 2012*, pp. 41 and 42.

Fig. 46. Comparison of long-term trends in coca bush cultivation and cocaine manufacture, 1990-2011



Source: UNODC international crop monitoring programme.

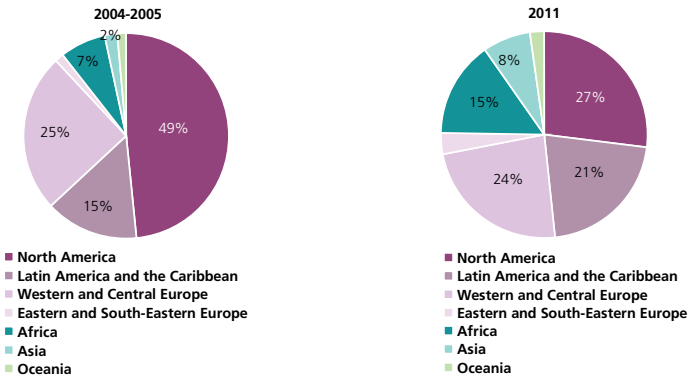
[a] As of 2005, new conversion factors have been applied for Colombia. Although the transition may have been gradual, UNODC believes that the new factors reflect real improvements in efficiency in the manufacture of cocaine in Colombia. The value for 2004, which represents a significant increase, is based on the old conversion factors.

area under cultivation in 2011 stood at three quarters of the level in 1990, the quantity of cocaine manufactured in 2011 was at least as high as the level in 1990 based on the lower estimate, with the higher estimate being equivalent to an increase of slightly more than a third. The cultivation and manufacture estimates imply an average overall yield of 4.2 kg of cocaine per hectare of coca bush over the period 1990-2001, and an average range of 5.1-6.8 kg per hectare over the period 2009-2011.

Global trends in the main demand indicators

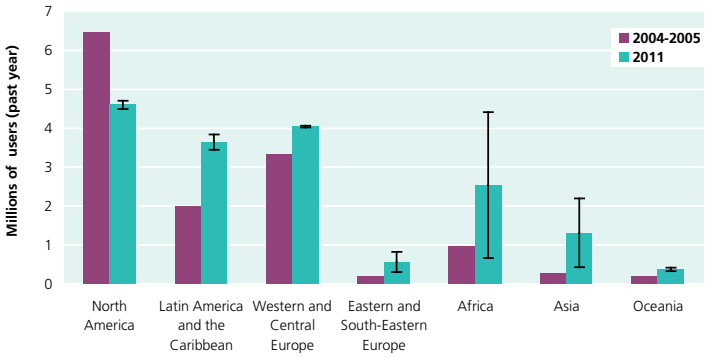
The latest estimates by UNODC indicate that 17 million people used cocaine at least once in the past year, equivalent to 0.37 per cent of the global population aged 15-64 (as of 2011). For an extended period, global demand for cocaine was dominated by two major consumer markets: North America and Western and Central Europe. Today, these two markets together are estimated to account for approximately one half of cocaine users globally. The extent of cocaine use appears to have been contained recently in both of these well-established markets. However, a comparison of the currently estimated number of cocaine users with users for the period 2004-2005 (see *World Drug Report 2006*, United Nations publication, Sales No. E.06.XI.10), based on the information available to UNODC at

Fig. 47. Distribution of cocaine users (annual prevalence), figures for 2011 compared with figures for the period 2004-2005



Source: UNODC estimates.

Fig. 48. Number of people who have used cocaine in the past year, figures for 2011 compared with figures for the period 2004-2005



Source: UNODC estimates.

the time, indicates a significant increase in Africa, Asia, Oceania, Latin America[85] and the Caribbean and Eastern and South-Eastern Europe.[26]

Several factors may be contributing to the increased importance of the markets of Africa, Asia, Oceania, Latin America and the Caribbean and Eastern and South-Eastern Europe. Apart from the social, psychological and cultural factors that may influence the use of an illicit substance such as cocaine, one other factor that may influence the extent of cocaine use – or indeed the use of any other drug - is the so-called spillover effect, whereby the ready availability of a drug, relatively low prices and proximity to source in production and transit countries may play a role in driving up its use. In the case of cocaine, this may apply in particular to Latin America and, to a lesser extent, West and Central Africa. The latest UNODC estimates indicate that, as at 2011, Latin America, the Caribbean and Africa collectively account for 6.2 million users (or 36 per cent of the global total).

Another factor which could determine changes in demand relates to the geographic distribution of the global population. The relatively stable markets of Western and Central Europe and North America account for only 14 per cent of the global population aged 15-64, so that even a minor change in the prevalence rate outside these markets can result in a major shift in global demand. UNODC estimates annual prevalence rates of 1.3 per cent for South America, 0.43 per cent for Africa and 0.05 per cent for Asia, all of which represent significant increases in comparison with its assessment of these rates for the period 2004-2005 (respectively, 0.7 per cent, 0.2 per cent and 0.01 per cent). The prevalence rates for Asia and Africa continue to be low compared with the established cocaine markets, so the potential for further growth cannot be discounted.

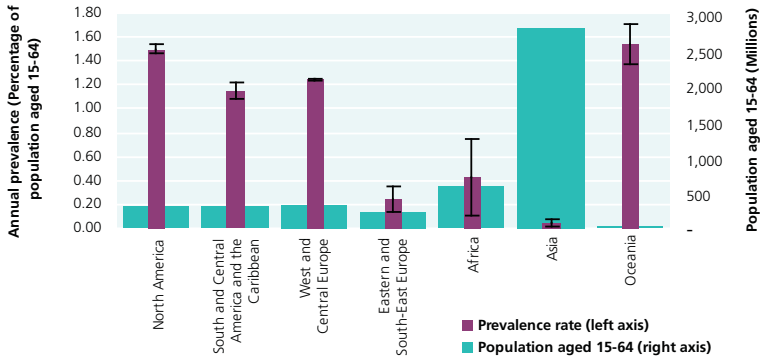
A related factor that could drive the demand for cocaine (or any other drug), if all other factors remain unchanged, is the sheer growth in global population and the consequent growth in the number of potential users. Indeed, given the relative stability of prevalence rates, global population appears to be, in and of itself, a reasonable indicator for the number of cocaine users. However, the impact of this can be seen more in the absolute number of users rather than their geographic distribution; despite the fact that countries in Asia and Africa tend to have higher population growth rates than countries in North America and Western and Central Europe, the proportion of the global population aged 15-64 in Asia and Africa together stood at 74 per cent in 2005 and had not yet reached 75 per cent by 2011.

Annual prevalence estimates of cocaine use reflect in part the scale of cocaine consumption, but these figures must be supplemented with other information. Firstly, the availability of data from Africa and Asia is limited, in part because cocaine use in these regions has so far been low and limited to a few countries and therefore possibly has not been perceived as a major threat; hence the corresponding levels of uncertainty are especially pronounced. Secondly, changes in the estimates may be driven partly by improvements in the methodology of UNODC and new national estimates that have become available. Thirdly, the average per capita consumption of cocaine by users needs to be determined by taking into account the significant variation among different countries in the prevalent culture and changing patterns in the use of different forms of

85 In accordance with the classification used by UNODC, Mexico is included with North America rather than Latin America.

86 A moderate increase in the number of users can also be seen for Western and Central Europe, but it is believed that this does not reflect the recent, shorter-term trend.

Fig. 49. Global population aged 15-64 and corresponding annual prevalence of cocaine use, 2011



Source: UNODC estimates (prevalence rates); United Nations, Department of Economic and Social Affairs, Population Division (population).

cocaine (such as crack cocaine as opposed to cocaine salts), in associated modes of administration (snorting, smoking and injecting) and even in the nature of the consumed product, with reports suggesting that cocaine is increasingly adulterated and cut with a variety of substances.

Cocaine use is often perceived to be more prevalent within the more affluent segments of society and the more affluent countries. As discussed above, the extent of cocaine use may be influenced by numerous factors, and wealth may not be foremost among them; there are several examples of wealthy countries with low prevalence rates and less wealthy countries with higher prevalence rates. Moreover, for certain forms of cocaine, notably some forms of cocaine base consumed in South America, a typical dose is significantly less expensive than a typical dose of cocaine salt. Nevertheless, although these are macro-level indicators, a comparison of national prevalence rate estimates with gross domestic product (GDP) per capita suggests that, while a relationship between these variables is difficult to ascertain at a global level, within certain regional groupings, notably those with less established or developing consumer markets, the suggestion of a correlation between disposable income and cocaine use may not be entirely groundless. More generally, such a link may possibly be observed within certain groups of countries that are relatively uniform in terms of other relevant parameters, such as those of a geographic, historical and even cultural nature. If indeed an association between an increase in disposable income and the risk of cocaine use were to be demonstrated, notwithstanding the other contributing factors, this would again point to Asia, with several highly populated countries registering strong and sustained economic performance, as a region exposed to potential increased cocaine use.

However, other socioeconomic aspects may also have a bearing; in the case of European countries with an established cocaine market, for example, the human development index appears to be more relevant than GDP. Although the data is inconclusive, it suggests that further investigation of the relationships between illicit drug use and socioeconomic parameters may be warranted.

Comparing supply and demand

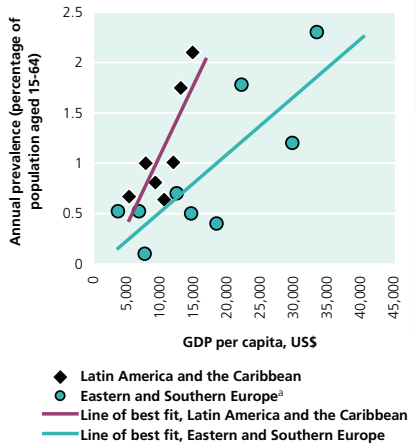
The long-term trend in the number of cocaine users worldwide indicates a gradual increase, driven to a large extent by the growth in global population. Interestingly, despite fluctuations due to short-term developments in the key countries of Bolivia (Plurinational State of), Colombia and Peru, estimates appear to show that the total quantity of manufactured cocaine has kept pace with demand in the long run.

Short periods where the increase in manufacture appeared to outperform or underperform that in the number of users were followed by corrections in the opposite direction, so that the broader equilibrium between supply and demand was roughly maintained.

The shorter-term developments in recent years are less clear because of the uncertainty in recent manufacture estimates, connected with the introduction of alternative conversion factors for Bolivia (Plurinational State of) and Peru. The upper estimates (which reflect the higher conversion factors) would suggest that estimates of how much cocaine was manufactured remained approximately in line with global demand, even though the trend was for declining levels of manufacture in the short term; if, instead, the lower estimates reflect reality, it would appear that global supply has now been below global demand for a significant period of time.[87]

87 It should be noted that this analysis reflects only the number of cocaine users and global cocaine manufacture estimates, and not necessarily the quantities consumed globally or quantities available for consumption.

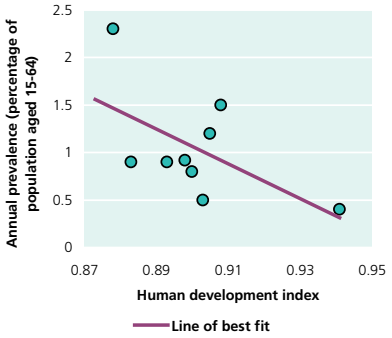
Fig. 50. Cocaine prevalence compared with gross domestic product (per capita), 2009-2011



Source: UNODC (prevalence rates); and IMF (gross domestic product per capita).

[a] Classification of the United Nations Department of Economic and Social Affairs, Statistics Division.

Fig. 51. Cocaine prevalence compared with human development index in European countries with an established consumer market,[a] 2009-2011



Source: UNODC (prevalence rates); and UNDP (human development index).

[a] Denmark, France, Germany, Iceland, Ireland, Netherlands, Norway, Spain and Switzerland. No aggregate prevalence data were available for the United Kingdom.

In both South America and Central America, when seizure quantities and the number of cocaine users are expressed as a proportion of the global totals, cocaine seizures clearly outperform cocaine use, in keeping with the role of these regions as source and transit regions. In the stable and well-established consumer markets of North America and Western and Central Europe, the relationship is inverted but the discrepancy is moderate, with the share of cocaine use only slightly more than double that of cocaine seizures at most (in the case of Western and Central Europe). In the developing and possibly the emerging markets, on the other hand, cocaine use outperforms cocaine seizures by far; in other words, the amount of seized cocaine per user is significantly lower than in North America or Western and Central Europe (see figure 54).

Trends in total seizures confirm the picture of stability or decline in the major production, consumer and transit regions, with pronounced upward trends being registered in regions where cocaine consumption has so far been limited, notably East Africa, Eastern Europe, South Asia and East and South-East Asia. A strong increase was also registered in Oceania, particularly in Australia, where cocaine use is already significant.

These depend also on other factors such as per capita consumption, seizures and purity of cocaine seized. Taking these elements into account would require improved and detailed knowledge of the parameters, but would likely result in the trend being adjusted downwards, for both supply and demand.

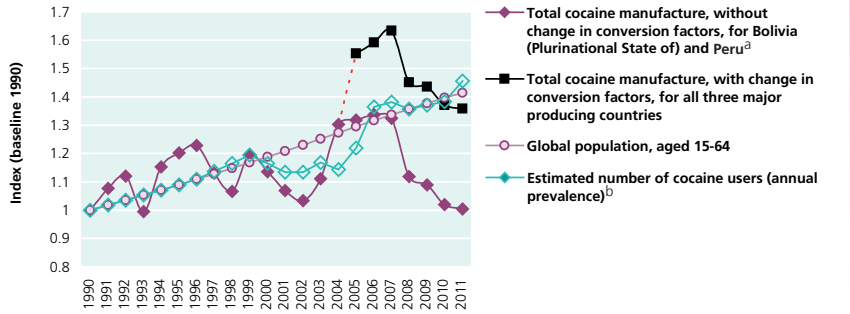
A shift in cocaine use in the Americas

Large quantities of cocaine continue to be smuggled from South America, notably Colombia, to the United States and Canada, with Ecuador, Mexico and countries in Central America as transit countries. However, the market for cocaine in the United States appears to have declined considerably, with both seizures and annual prevalence of cocaine use peaking in 2006 and following a parallel declining trend since then, with the exception of a rebound in cocaine seizures in 2011. The average purity of cocaine seized in the United States fell significantly between 2006 and 2009 at both the retail level (from 74 per cent to 47 per cent, for quantities of 2 g or less) and higher up in the distribution chain (from 84 per cent to 71 per cent for quantities greater than 50 g); moreover, reduced levels were sustained in 2010 and 2011, with only a slight rebound at the retail level (in 2011, these average purity levels stood at 52 per cent and 71 per cent respectively). Purity-adjusted prices at the retail level peaked in 2009 but as of 2011 remained higher than in the 2002-2006 period, even when adjusted for inflation.[88]

It is likely that disruptions in the chain of supply resulting from law enforcement intervention and other developments, such as inter-cartel violence, contributed significantly to reducing the availability of cocaine at destination, with seizures moving closer to source (declining in the United States at around the same time as Colombia registered an increase). A breakdown of cocaine seizures in

88 United States, Office of National Drug Control Policy, *National Drug Control Strategy: Data Supplement 2012*.

Fig. 52. Comparison on long-term trends in main global cocaine supply and demand indicators, 1990-2011

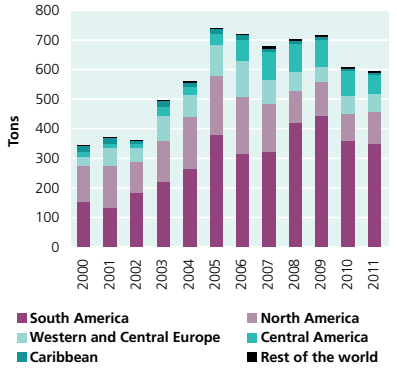


Source: UNODC international crop monitoring programme (manufacture estimates) and estimates (prevalence rates); United Nations, Department of Economic and Social Affairs, Population Division (population data).

[a] As of 2005, new conversion factors have been applied to Colombia. Although the transition may have been gradual, UNODC believes that the new factors reflect real improvements in efficiency in Colombia. The value for 2004, which represents a significant increase, is based on the old conversion factors.

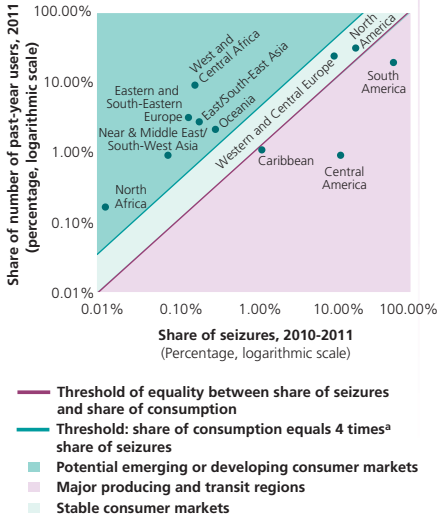
[b] Direct estimates for years prior to 1996 were not available. For 1990-1995, the prevalence rate is assumed to be constant at the 1996 level.

Fig. 53. Global cocaine seizures, 2000-2011



Source: UNODC, data from annual report questionnaire and other official sources.

Fig. 54. Comparison on cocaine seizures and number of cocaine users, as proportion of global total, by subregion



Source: UNODC, data from annual report questionnaire and other official sources and estimates (number of users).

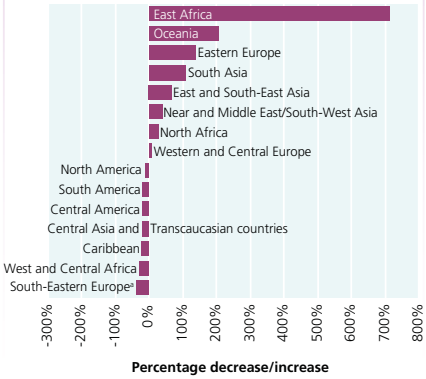
[a] This value is chosen empirically, rather than on the basis of any theoretical consideration.

Colombia also suggests that the Atlantic route has gained in importance in comparison with the Pacific route. Seizures by United States authorities along the south-west border increased over the period 2008-2011; in contrast, seizures in Mexico in 2010 and 2011 stood at approximately one fifth of the peak level of 2007.

Brazil, with its extensive land borders with all three major source countries for cocaine, a large population, significant levels of use of both cocaine salt and crack cocaine and a long coastline affording easy access to the Atlantic ocean for onward trafficking to Africa and Europe, plays an important role in the global cocaine market as both a destination and a transit country.

In 2011, more than half of the cocaine seized in Brazil originated in the Plurinational State of Bolivia (54 per cent), followed by Peru (38 per cent) and Colombia (7.5

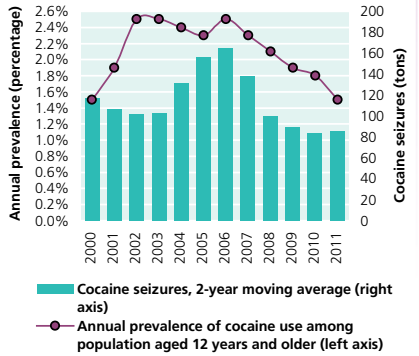
Fig. 55. Cocaine seizure trends, 2010/11 compared with 2008/09, by subregion



Source: UNODC, data from annual report questionnaire and other official sources.

Note: Due to lack of available data, the subregion of southern Africa is not included.
[a] The decline in South-Eastern Europe is mainly due to a single large seizure in Romania in 2009, and may not necessarily reflect the trend in cocaine trafficking in South-Eastern Europe.

Fig. 56. Annual prevalence of cocaine use and cocaine seizures in the United States, 2000-2011



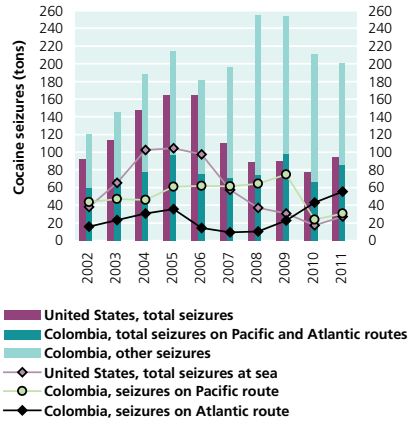
Source: UNODC, data from annual report questionnaire and other official sources.

per cent).[89] The Plurinational State of Bolivia, the only country among the three major source countries not to have direct access to the open sea, identified Brazil as the foremost planned destination for seized cocaine.

Brazil also reported an increase in the use of cocaine in the

89 Annual report questionnaire replies submitted by Brazil for 2011.

Fig. 57. Cocaine seizures in the United States and Colombia, 2002-2011



Source: UNODC, data from annual report questionnaire and other official sources.

general population. According to a study[90] conducted among college students in the 27 Brazilian state capitals, the annual prevalence of cocaine use among college students stood at 3 per cent. The estimated prevalence of cocaine use among the general population is estimated at 1.75% and is also consistent with the trend of increasing cocaine use in Brazil.

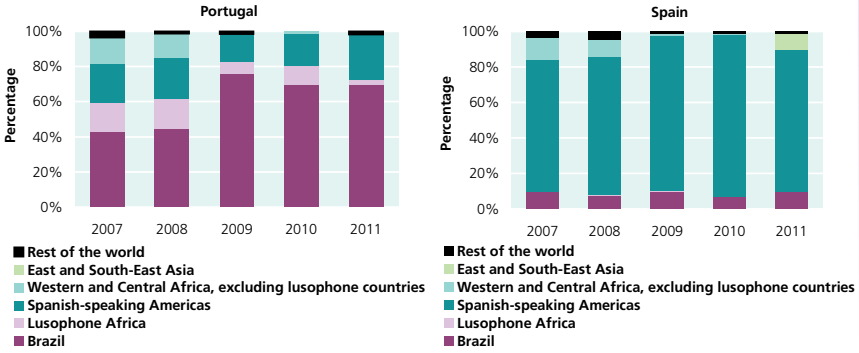
Brazil is also a point of transit for cocaine consignments trafficked to West and Central Africa and Europe, notably the Iberian peninsula. It appears that the linguistic and cultural ties with Portugal and lusophone countries in Africa play a role in this phenomenon, as Brazil occurs more frequently as a country of provenance among individual cocaine consignments seized by Portugal than those reported by Spain. In the case of seizures reported by Portugal, the frequency of Brazil as the country of provenance also rose markedly from 2008 to 2009.

Developments in Europe

In parallel with the trend in the United States, cocaine seizures in Western and Central Europe declined rapidly from the peak level of 2006, and appear to have stabilized at a lower level. A similar trend, starting in 2008, was seen in the estimated average purity of cocaine, based on price and purity data from 14 countries in Western and Central Europe. Estimations of the purity-adjusted prices in these countries, however, suggest that the reduction in availability was not as pronounced as in the United States; moreo-

90 Brazil, National Secretariat for Drug Policies, *1st Nationwide Survey on the Use of Alcohol, Tobacco and other Drugs among College Students in the 27 Brazilian State Capitals* (Brasilia, 2010).

Fig. 58. Distribution of countries of provenance of individual seizures of cocaine-type drugs reported by Portugal and Spain, by number of seizures, 2007-2011



Source: UNODC, individual drug seizure database.

Note: Reporting countries are asked to provide information about the country where the drugs were obtained (or, in the case of unaccompanied shipments, the departure country). For the purposes of this figure, this is considered as the provenance of the drug. However, countries are also asked to provide information on the country of origin, i.e., where the drugs were produced/manufactured. In cases where the country where the drugs were obtained is not specified, or coincides with the country that made the seizure, the country of origin is taken as the provenance. In order to reflect patterns in transnational trafficking, any cases where the provenance coincides with the country making the seizure, or where no information on provenance is known, are excluded.

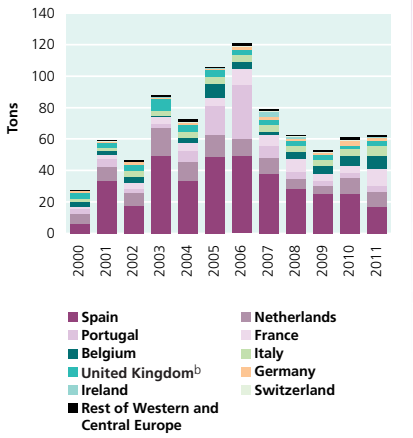
ver, the purity-adjusted price in Western and Central Europe remains moderately higher than in the United States. Prevalence data from some of the major consumer countries in Western Europe corroborate the general picture of a decline in the cocaine market. However, other parts of Europe with a limited market for cocaine have shown signs of a possible emergence as consumer or transit countries.

Spain, an important transit and consumer country for cocaine in Europe, registered a pattern similar to that observed in the United States, with seizures falling steadily between 2006 and 2011, and the prevalence estimates for 2009 and 2011 also showing distinct declines. Prevalence data for England and Wales also showed a decline from an annual prevalence rate of 3.0 per cent among the population aged 16-59 in 2008/09 to 2.2 per cent in 2011/12.

Cocaine use and trafficking in Eastern and South-Eastern Europe has so far been limited. However, some countries in these regions have registered recent increases or fluctuations in cocaine seizures. Turkey attributed the recent increase in cocaine seizures to its role as a destination country and its more recent role as a transit country. Reports on the provenance of cocaine in 2010 and 2011 from Albania, Austria, Bulgaria, Hungary, Poland, Romania, Serbia, Turkey and Ukraine, taken together, point to the possible emergence of cocaine trafficking routes overlapping to some extent with the established Balkan route for heroin trafficking and being used to convey limited quantities of cocaine to Central and Eastern Europe.

The overlap between cocaine and heroin trafficking routes may begin in Turkey, or possibly also closer to the destination, such as the port of Constanta in Romania. Austria has concluded, based on drug seizures made in 2011, that 10 per cent of cocaine entered its territory via the Balkan

Fig. 59. Cocaine[a] seizures in Western and Central Europe, 2000-2011

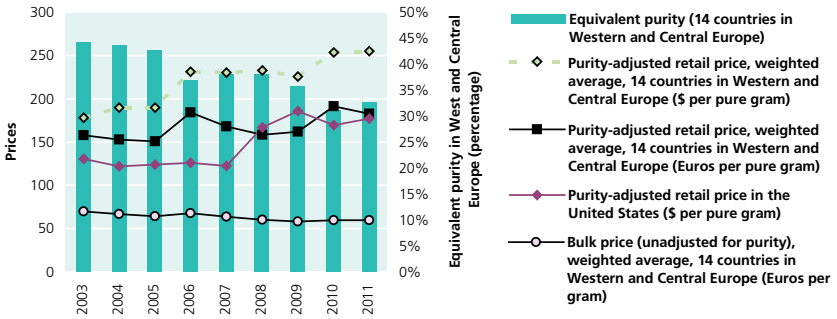


Source: UNODC, data from annual report questionnaire and other official sources.

[a] Includes cocaine salts, base, paste and crack.

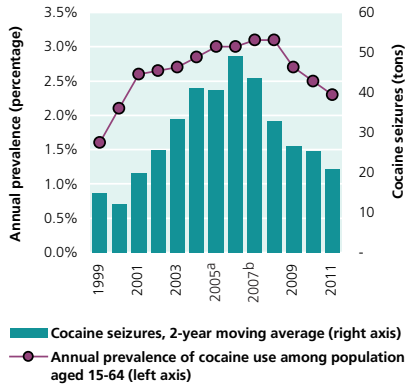
[b] For 2011, the quantity for the United Kingdom covers England and Wales only (and refers to the financial year 2011/12).

Fig. 60. Cocaine retail prices in the United States and Western and Central Europe, 2003-2011



Source: Estimates based on annual report questionnaire and data from Europol and the United States Office of National Drug Control Policy.

Fig. 61. Annual prevalence of cocaine use and cocaine seizures in Spain, 1999-2011



Source: UNODC, data from annual report questionnaire and other official sources; annual report questionnaire and EMCDDA (prevalence).

[a] Only one prevalence estimate was available for the reference period 2005-2006.
[b] Only one prevalence estimate was available for the reference period 2007-2008.

route. According to Turkish authorities,[91] certain large organizations in Turkey known to have been involved in heroin trafficking in the past have shifted their operations in part to cocaine smuggling. In addition to seizures made at airports Turkish law enforcement agencies made larger seizures of cocaine found in containers and maritime vessels in 2011.

91 Turkish National Police, Department of Anti-Smuggling and Organized Crime, *Turkish Report of Anti-Smuggling and Organized Crime, 2011* (Ankara, March 2012).

The provenance of cocaine entering Europe along this route appears to vary. Frequently, cocaine transits Africa before reaching South-Eastern Europe, and the involvement of West African nationals is common. In other cases, traffickers obtain cocaine directly from South America, frequently from Brazil. Limited but non-negligible amounts of cocaine have also been seized in the Syrian Arab Republic, Lebanon and, notably, Israel, which registered an increase in 2011; hence a link between this emerging route and the Near and Middle East cannot be excluded.

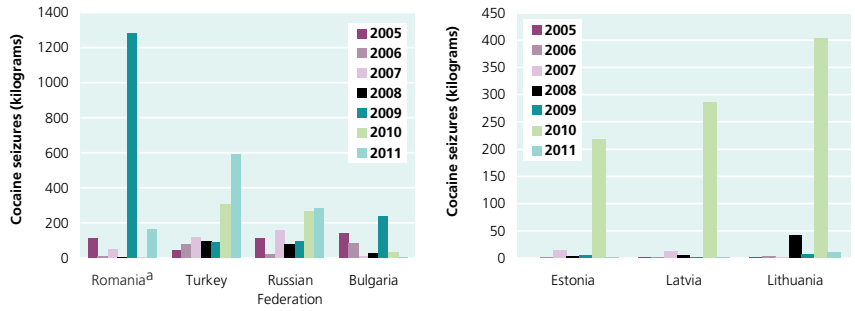
Another area of Europe that has shown signs of a possible expansion of the cocaine market is that of the Baltic countries. Estonia, Latvia and Lithuania each registered a spike in cocaine seizures in 2010. This included significant quantities being trafficked into these countries by sea. Reports suggest that some of the cocaine reaching the Baltic States is trafficked further to Eastern Europe and possibly Scandinavia. Based on expert perceptions, Estonia reported recent increases in the use of cocaine in its own consumer market.

An expanded market in Oceania

Cocaine seizures in Oceania reached new highs in 2010 and 2011, driven mainly by the quantities reported by Australia. In addition to the major transit countries for cocaine, Canada was identified by both Australia and New Zealand as a transit country for significant quantities of cocaine reaching their territories. In terms of the number of cases, the United Kingdom, the United States and Thailand were also prominent embarkation countries among cocaine border detections in Australia over the 2010/11 financial year.

Australia registered increasing seizures across most drug types, so the upward trend may possibly be attributable to changes in law enforcement efforts rather than the availability of cocaine. However, the annual prevalence rate for

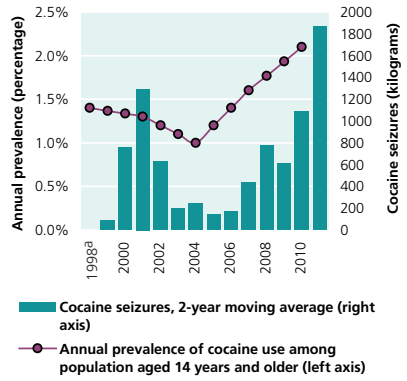
Fig. 62. Cocaine seizures in selected countries in Europe with previously limited cocaine markets registering recent increases or fluctuations, 2005-2011



Source: UNODC, data from annual report questionnaire and other official sources.

[a] The high level of seizures in Romania in 2009 was mainly due to a single large seizure in the port of Constanta.

Fig. 63. Annual prevalence of cocaine use and cocaine seizures in Australia, 1999-2011



Source: UNODC, data from annual report questionnaire and other official sources

[a] Seizure data for 1997 from Australia were not available; hence the 1997-1998 average could not be calculated.

cocaine use among the population aged 14 and over was estimated at 2.1 per cent in 2010, up from 1.6 per cent in 2007 and 1.0 per cent in 2004. This suggests that the cocaine consumer market in Australia has expanded, and there is currently no evidence to show that the increasing trend has stabilized.

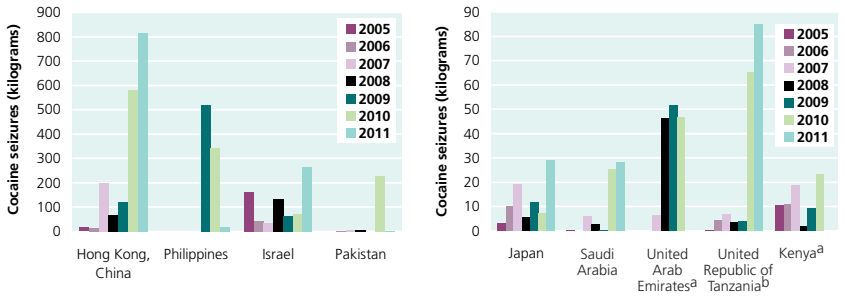
Possibly emerging markets in Africa and Asia

Overall, the use of cocaine in Africa remains limited in comparison with the markets in the Americas and Western and Central Europe. South Africa and Nigeria have both had a sizeable consumer market for cocaine for some time, and both of these countries also play a significant role as transit countries. By 2007, West Africa had acquired an important role as a transhipment hub for cocaine trafficked from South America to Europe. Although the importance of this role may have since receded, the cocaine market in Africa may have grown more complex. West African nationals remain prominent among traffickers and organized networks smuggling cocaine (as well as other drugs) to various destinations. The routes from West Africa to Europe may have shifted away from flights to European airports and the northbound maritime routes along the African coast that prevailed in 2007 to land trafficking routes. The availability of cocaine in West Africa and along the land trafficking routes may also have fuelled an increase in cocaine use in West and North Africa; over the period 2009-2011, Algeria, Burkina Faso, Côte d'Ivoire and Morocco each reported increases in cocaine use based on expert perceptions, and the latest changes reported by Ghana and Togo (relative to 2008) also indicated rising cocaine use.

The prevalence rate in Kenya, while probably still lower than in Nigeria or South Africa, implies a sizeable consumer market of its own, and there are indications that East Africa may have acquired increased importance as a destination or as a transit region. The United Republic of Tanzania reported seizures of 65 kg in 2010, a level which, although small, significantly exceeds those recorded in previous years. Although comprehensive data from the United Republic of Tanzania for 2011 were not available, the partial total had reached 85 kg by April 2011. It is not clear whether these quantities were intended for the consumer market in East Africa or possibly other destinations.

The provenance of cocaine in East Africa was also not clear, but in addition to West Africa, the Gulf region, itself a region with a limited but possibly growing market, has also

Fig. 64. Cocaine seizures in selected countries in Africa and Asia with previously limited cocaine markets registering recent increases or fluctuations, 2005-2011



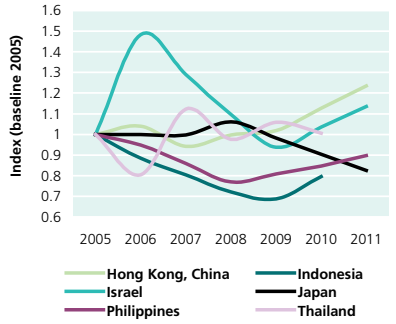
Source: UNODC, data from annual report questionnaire and other official sources.

[a] For Kenya and the United Arab Emirates, comprehensive seizure data for 2011 were not available.
[b] For 2011, the quantity for the United Republic of Tanzania covers January-April only.

emerged as a possible source. The United Arab Emirates and Saudi Arabia have both registered increased seizures of cocaine in recent years. Uganda, as well as Poland and Thailand, identified the United Arab Emirates as a transit country for seized cocaine reaching their territory in 2011, and Yemen identified the Comoros as a destination. Qatar was also identified as a transit country by Japan, which has in turn increased its seizures of cocaine.

Among the markets with the potential for growth in the extent of cocaine use, that of East and South-East Asia arguably presents the greatest risk of expansion. Seizures in Hong Kong, China, rose sharply to almost 600 kg in 2010 and had topped 800 kg by 2011. According to authorities in Hong Kong, China,[92] recent seizures included single cases of 649 kg, 567 kg and 147 kg. In 2011, an increase of slightly more than 10 per cent was recorded in the number of registered cocaine users, and there were 11 cases of small-scale processing to obtain crack cocaine (probably starting from cocaine salt). The Philippines has also seized relatively large quantities of cocaine in recent years, some of which was recovered from a shipment that was likely intended for Hong Kong, China. Thailand, a country with a large consumer market for stimulants (specifically ATS) but, so far, limited cocaine use, also identified the Philippines among the transit countries for cocaine reaching its territory, in addition to Pakistan, another country which recorded uncharacteristically high cocaine seizures in 2010. A recent survey on drug use in Pakistan confirms the emergence of limited use of cocaine in Pakistan.[93]

Fig. 65. Trends in inflation-adjusted cocaine retail prices, in local currency, selected countries and territories in Asia, 2005-2011



Source: UNODC, data from the annual report questionnaire and information provided by Governments (prices), IMF (consumer price indices).

Despite these signs of a tentative emerging cocaine market, limited price data from countries in Asia does not suggest any significant increases in availability (although they would be compatible in some cases with a possible increase in demand), with the possible exception of Japan, where the typical retail price in 2011 decreased moderately between 2008 and 2011.

92 Country report by Hong Kong, China, presented at the Thirty-sixth Meeting of Heads of National Drug Law Enforcement Agencies, Asia and the Pacific, Bangkok, 30 October-2 November 2012.

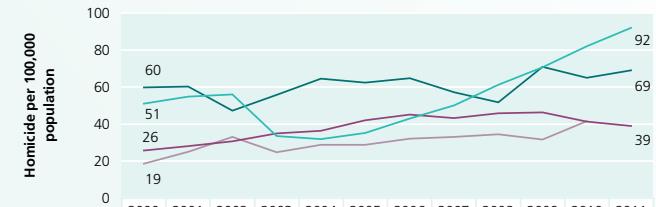
93 UNODC and Pakistan, "Drug use in Pakistan 2013: technical summary report".

Central America: drug trafficking and violence

Cocaine has been trafficked through Central America for decades, but the importance of the region to the flow of cocaine increased after 2000 and again after 2006, following an increase in drug law enforcement efforts in Mexico. While the cocaine flow through the region declined markedly over the period 2006-2011, some of it was displaced to Central America, as traffickers looked for alternative routes, particularly along the border between Guatemala and Honduras. In the process, they often entered into cooperation with local organized criminal groups, which had long been engaged in a range of criminal activities, including drug trafficking, extortion and smuggling of migrants. This development appears to have intensified competition between local groups and to have led to growing levels of violence in some areas.

The correlation between contested trafficking areas and high homicide rates is most obvious in Guatemala and Honduras. Some of the most violent areas lie along the Honduran coast, on both sides of the Guatemalan/Honduran border, as well as in Guatemala along the borders with Belize and Mexico.

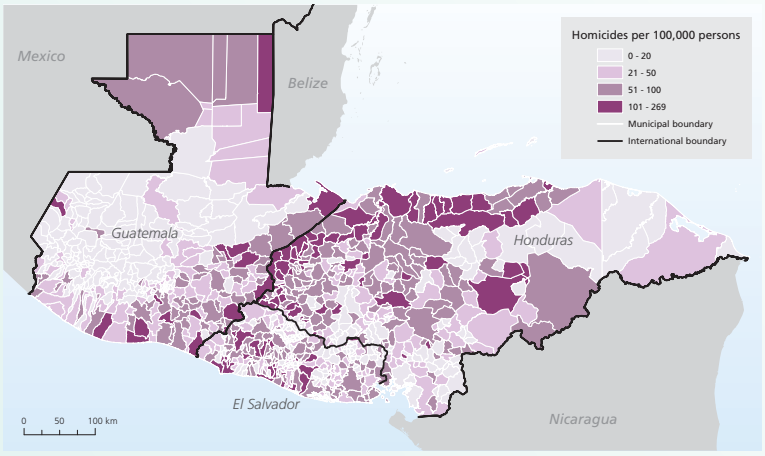
Homicide rates in northern Central America, 2000-2011



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Belize	19	25	33	25	29	29	32	33	34	32	42	
El Salvador	60	60	47	56	65	62	65	57	52	71	65	69
Guatemala	26	28	31	35	36	42	45	43	46	46	41	39
Honduras	51	55	56	34	32	35	43	50	61	71	82	92

Source: UNODC Homicide Database.

Homicide rates by municipal area in northern Central America, 2011



Source: UNODC, Transnational Organized Crime in Central America and the Caribbean: A Threat Assessment (September 2012).

F. THE MARKET FOR AMPHETAMINE-TYPE STIMULANTS

New psychoactive substances have become a global phenomenon

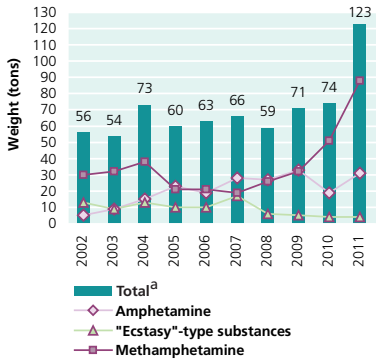
The range of new psychoactive substances on the markets for ATS is at its peak, exceeding the number of substances that are currently within the scope of the Single Convention on Narcotic Drugs of 1961 and the Convention on Psychotropic Substances of 1971. The issue of NPS is covered extensively in chapter II.

Global amphetamine-type stimulant seizures rise to highest level ever recorded

Seizures of ATS have reached new highs: 123 tons in 2011 compared with 74 tons in 2010 , a 66 per cent rise. Seizures increased across all regions, with Asia, North America and Europe registering dramatic increases.

The overall increase in ATS seizures is mainly due to surging methamphetamine seizures, which grew by 73 per cent from 51 tons in 2010 to 88 tons in 2011. The highest methamphetamine seizures were reported by Mexico, where seizures more than doubled, from 13 tons to 31 tons, and surpassed for the first time those of the United States which seized 23 tons in 2011, up from 15 tons in 2010. Seizures rose steeply in the Americas (28 tons to 54 tons), Asia (21 tons to 32 tons) and Europe (576 kg to 2 tons).

Fig. 66. Global seizures of amphetamine-type stimulants, 2002-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

[a] Including seized amphetamine, "ecstasy"-type substances, methamphetamine, non-specified amphetamine-type stimulants, other stimulants and prescription stimulants. For the categories of other stimulants and prescription stimulants, seizures reported by weight or volume only are included.

Methamphetamine accounts for 71 per cent of global ATS seizures and, as in previous years, most of the world's methamphetamine seizures (61 per cent) are reported by countries in North America. After a significant surge in methamphetamine seizures in Mexico in 2010, seizures doubled again from 13 tons to 31 tons, making it the

Categories of new psychoactive substances sold on the global market

Synthetic cannabinoids: These are cannabinoid receptor agonists which produce effects similar to those of *delta*-9-tetrahydrocannabinol (THC), the principal psychoactive component in cannabis. Synthetic cannabinoids are often laced with herbal products and sold as *Spice, K2, Kronic*, etc.

Synthetic cathinones: These are analogues and derivatives of the internationally controlled substance cathinone, one of the active components of the khat plant. They generally have stimulant effects and include frequently reported NPS such as mephedrone and methylenedioxypyrovalerone (MDPV).

Ketamine: A human and veterinary anaesthetic which acts as a stimulant at low doses and a hallucinogen at high doses. It is one of the most widespread NPS in Asia.

Phenethylamines: This group contains substances related to amphetamine and methamphetamine, and generally produces stimulant effects. However, modification of these compounds can lead to potent hallucinogens such as Bromo-Dragonfly.

Piperazines: These substances are frequently sold as "ecstasy" because of their central nervous system stimulant properties. The most commonly reported substances in this group are N-benzylpiperazine (BZP) and 1-(3-chlorophenyl)piperazine (*m*CPP).

Plant-based substances: This group includes plants with psychoactive properties. The most frequently reported are:

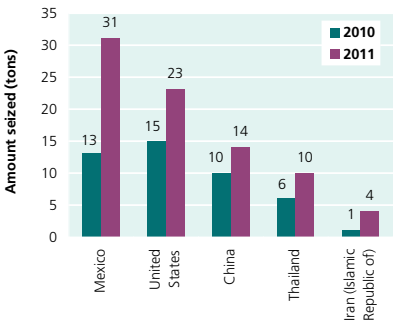
Kratom (*Mitragyna speciosa*), a plant indigenous to South-East Asia that contains the alkaloid mitragynine; a stimulant at low doses and sedative at high doses.

Salvia divinorum, a plant indigenous to forest areas in Oxaca, Mexico, which contains the active ingredient salvinorin A, a hallucinogenic substance.

Khat (*Catha edulis*), a plant native to the horn of Africa and the Arabian peninsula. The leaves of the plant are chewed, resulting in the release of the stimulants cathinone and cathine.

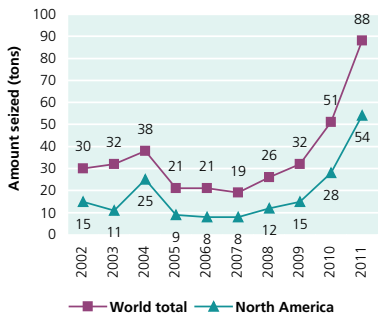
Other substances: These include aminoindanes (stimulants), phencyclidine-type substances (hallucinogens) and tryptamines (hallucinogens).

Fig. 67. Countries reporting the highest methamphetamine seizures, 2010-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

Fig. 68. Methamphetamine seized worldwide and in North America, 2002-2011



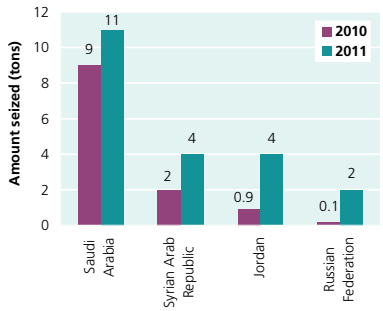
Source: UNODC, data from the annual report questionnaire and other official sources.

country where the most methamphetamine was seized. East and South-East Asia also continue to make up a significant share of the global methamphetamine market, with the highest seizures reported from China (10 tons in 2010 to 14 tons in 2011), Indonesia (354 kg to 1 ton), Malaysia (920 kg to 1 ton) and Thailand (6 tons to 10 tons).

Methamphetamine laboratories were reported by all regions. Most methamphetamine laboratories continue to be reported by the United States, where their numbers quadrupled from 2,754 in 2010 to 11,116 in 2011. In North America, Mexico and Canada reported 159 and 35 laboratories respectively, both showing an upward trend compared with 2010. In addition, 350 laboratories were reported by countries in Europe, most of them by the Czech Republic, where 338 laboratories were identified. To compound the situation, new methamphetamine laboratories have been reported by some countries for the first time. The dismantling of one methamphetamine laboratory was reported by Belgium and four such laboratories were seized in the Russian Federation. Poland saw a re-emergence of the existence of methamphetamine laboratories with the identification of two laboratories for the first time since 2007. Clandestine manufacture is also taking place in Oceania, with 109 methamphetamine laboratories reported by New Zealand.

Amphetamine seizures were also on the increase in 2011, the most significant taking place in the Near and Middle East and South-West Asia, from 14 tons in 2010 to 20 tons in 2011. As in previous years, the highest amphetamine seizures were registered by Saudi Arabia (11 tons), the Syrian Arab Republic (4 tons) and Jordan (4 tons). Total seizures rose by 55 per cent, from 20 tons in 2010 to 31 tons in 2011, after having declined in 2010. Increases were reported by all regions. In Europe, particularly in the Russian Federation, seizures of amphetamines increased from 142 kg in 2010 to more than 2 tons in 2011. Laboratory

Fig. 69. Countries reporting the highest amphetamine seizures, 2010-2011



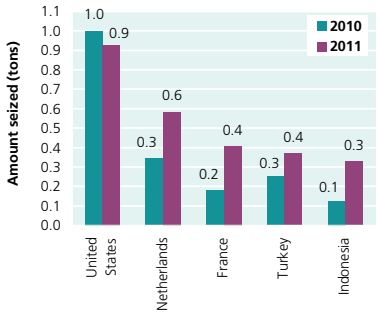
Source: UNODC, data from the annual report questionnaire and other official sources.

Note: With the exception of the Russian Federation, which reported seizures in "powder form", all other countries shown in this table seized amphetamines in pill form (mostly Captagon).

activity was reported to have increased in Belarus, where nine laboratories were seized in 2011 after none had been reported in 2010 and two in 2009. At the global level, the number of reported amphetamine laboratories remained largely stable, with 131 laboratories uncovered in 2011 compared with 103 in 2010. Europe accounted for most laboratories (69 laboratories) seized worldwide. With regard to the Near and Middle East region, where most of the world's amphetamine seizures are made, Lebanon reported the seizure of three laboratories manufacturing amphetamine base and two Captagon[94] laboratories.

94 Captagon was originally the trade name for fenetylline, a synthetic stimulant. Analysis of seized Captagon pills show that most contain amphetamine and other ingredients such as caffeine and theophylline.

Fig. 70. Countries reporting the highest "ecstasy"-type substance seizures, 2010-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

There are indications of possible "ecstasy" manufacture in Mexico, with 2,500 litres of safrole, one of the principal precursors of MDMA, seized at an airport in 2011 and three shipments of safrole reported as suspicious since June 2010.[95] Large quantities of methylamine, a non-scheduled chemical, which can be used in the manufacture of "ecstasy" as well as methamphetamine, have been seized in Mexico with a total of 154,000 litres reportedly seized by mid-2011.[96] The number of "ecstasy" laboratories remained stable (39 laboratories), with the existence of "ecstasy" laboratories mainly reported by Oceania, East and South-East Asia and North America.

With respect to seizures, the global level of "ecstasy" seizures has been stable or declining since 2008. At 3.6 tons, compared with 3.8 tons in 2010, seizures of "ecstasy"-type substances decreased by 5 per cent in 2011, reflecting fewer seizures reported by Canada and China. However, seizures rose in Europe and Oceania. Most "ecstasy" was seized in the United States, the Netherlands and France.

Increased seizures of crystalline methamphetamine in East and South-East Asia point to a more diversified market for amphetamine-type stimulants

Traditionally, methamphetamine pills are the most widespread ATS in East and South-East Asia. In 2011, however, seizures of crystalline methamphetamine reached their highest level during the past five years, an indication that the ATS market has become more diversified. In 2011, a total of approximately 8.8 tons of crystalline methamphetamine were seized in the region, representing a 28 per cent increase over the approximately 7 tons seized in 2010. Record-level seizures were reported in a number of countries during the year. In 2011, more than 1 ton of crystalline methamphetamine was seized in Malaysia, representing a 39 per cent increase compared with 2010 and the highest total ever reported by the country. Indonesia seized more than 1 ton of crystalline methamphetamine in 2011, the highest total reported during the past five years. Seizures in Thailand reached a record high of more than 1 ton in 2011, much higher than the 706 kg seized in 2010. Record seizures were also reported from Cambodia (19 kg) and Singapore (14 kg), although the amounts seized were comparatively low by regional standards. The largest portion of crystalline methamphetamine seizures continued to be made in China, where more than 4 tons seized in 2011 accounted for half of the regional total.

Fig. 71. Crystalline methamphetamine seizures in East and South-East Asia, 2007-2011

Source: Based on data collected by the Drug Abuse Information Network for Asia and the Pacific including data for Brunei Darussalam, Cambodia, China, Indonesia, Japan, the Lao's People Democratic Republic, Malaysia, Myanmar, the Philippines, the Republic of Korea, Singapore, Thailand and Viet Nam.

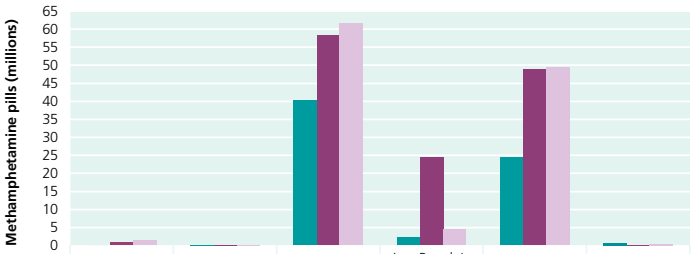
With respect to methamphetamine pills ("yaba"), the eastern Shan State in Myanmar remains a key source in the region. In 2011, authorities in Myanmar seized a small number of pill pressing machines and related equipment used to make methamphetamine pills from two separate clandestine methamphetamine manufacturing facilities.[97] However, the low number of manufacturing operations dismantled is inconsistent with the high amount of seizures made. Methamphetamine pills produced in Myanmar are trafficked to neighbouring countries, particularly China, the Lao People's Democratic Republic and Thailand. To a lesser extent, methamphetamine pills are also smuggled to

95 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis.*

96 *Precursors and Chemicals Frequently Used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances: Report of the International Narcotics Control Board for 2011 on the Implementation of Article 12 of the United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988* (United Nations publication, Sales No. E.12.XI.4).

97 Presentation by the Central Committee for Drug Abuse Control of Myanmar at the Global Synthetics Monitoring: Analysis, Reporting and Trends (SMART) Programme regional workshop, Phnom Penh, 24 and 25 July 2012.

Fig. 72. Methamphetamine pill seizures by countries neighbouring Myanmar, 2009-2011



	Bangladesh	Cambodia	China	Lao People's Democratic Republic	Thailand	Viet Nam
2009	0.13	0.14	40.50	2.30	24.60	0.56
2010	0.81	0.08	58.40	24.50	48.80	0.22
2011	1.40	0.24	61.90	4.60	49.40	0.37

Source: Based on data collected by the Drug Abuse Information Network for Asia and the Pacific, the National Narcotics Control Commission of China, the Office of the Narcotics Control Board of Thailand, and the Standing Office on Drugs and Crime of Viet Nam.

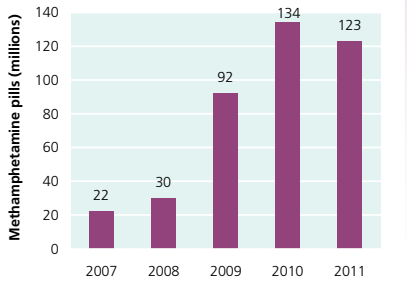
Bangladesh, where seizures of methamphetamine pills have increased, from 812,716 methamphetamine pills in 2010 to 1,4 million methamphetamine pills in 2011.

In 2011, seizures of methamphetamine pills remained high in East and South-East Asia, a total of 122.8 million methamphetamine pills were seized. While this figure represents a 9 per cent decrease compared with the 134.4 million pills seized in 2010, it is 33 per cent higher than the 92.1 million pills seized in 2009 and a five-and-a-half fold increase compared with the 2007 figure (22.4 million pills seized).

In 2011, the number of pills seized in China (61.9 million), Thailand (49.4 million), Myanmar (5.9 million) and the Lao People's Democratic Republic (4.6 million) accounted for 98 per cent of the total seizures during the year (as these four countries did in 2010). The largest relative increases were reported by Cambodia (189 per cent), Myanmar (169 per cent) and Singapore (120 per cent), although the number of methamphetamine pills seized is low by regional standards. Viet Nam also reported a large increase (65 per cent) in methamphetamine pill seizures in 2011, with 366,000 synthetic drug pills seized, most of which were likely to have been methamphetamine pills. However, methamphetamine pill seizure data are not uniformly reported from Viet Nam, making year-by-year comparisons for that country difficult.

"Ecstasy" has been in decline in recent years, but in 2011 "ecstasy" seizures showed an increase in Brunei Darussalam, Cambodia, Indonesia, Japan, Malaysia, the Philippines, the Republic of Korea and Thailand. "Ecstasy" manufacture continues to be reported in the region, particularly in Indonesia and Malaysia. Manufacture in the region has consisted primarily of pill pressing and re-pressing operations, although some "ecstasy" production facilities have been dismantled in Indonesia. Safrole-rich oils, which can serve as precursors in the manufacturing process, continue to be smuggled from Cambodia and China.

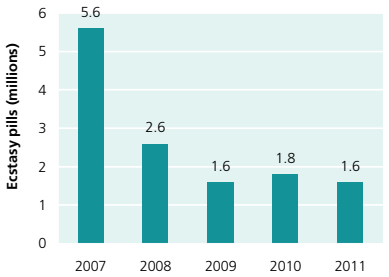
Fig. 73. Methamphetamine pill seizures in East and South-East Asia, 2007-2011



Source: Based on data collected by the Drug Abuse Information Network for Asia and the Pacific , including data for Brunei Darussalam, Cambodia, China, Indonesia, Japan, the Lao's People Democratic Republic, Malaysia, Myanmar, the Philippines, the Republic of Korea, Singapore, Thailand and Viet Nam.

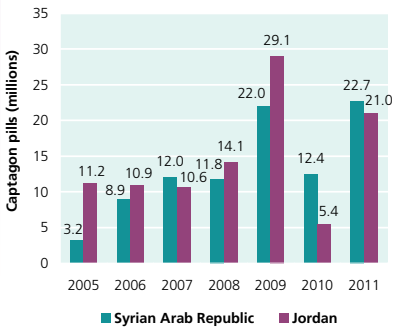
In 2011, some 400 illicit synthetic drug manufacturing facilities were seized in East and South-East Asia, most of which were manufacturing methamphetamine. While this figure is lower than the number reported for 2010 (442), it is more than three times the number of illicit manufacturing facilities seized in 2007 (125). China continued to report high, albeit declining, levels of illicit synthetic drug manufacture with 357 illicit synthetic drug manufacturing facilities seized in 2011. It is unclear how many of these facilities were specifically manufacturing methampheta-

Fig. 74. "Ecstasy" seizures in East and South-East Asia, 2007-2011



Source: Based on data collected by the Drug Abuse Information Network for Asia and the Pacific, including data for Brunei Darussalam, Cambodia, China, Indonesia, Japan, the Lao's People Democratic Republic, Malaysia, Myanmar, the Philippines, the Republic of Korea, Singapore, Thailand and Viet Nam.

Fig. 75. Captagon pill seizures in Jordan and the Syrian Arab Republic, 2005-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

mine. Illicit drug manufacture has expanded from the southern coastal areas of China to northern and central areas of the country; in 2011, illicit drug manufacturing facilities were seized in 29 of the 33 provinces, municipalities and autonomous regions of China.

Illicit laboratories were also seized in Cambodia, Indonesia, Malaysia, the Philippines and Thailand; these were mostly smaller-scale laboratories, which are mobile and can be more easily relocated. Malaysia also reported the seizure of one illicit nimetazepam (Erimin-5) manufacturing facility, a substance which is frequently sold on the illicit ATS market.[98]

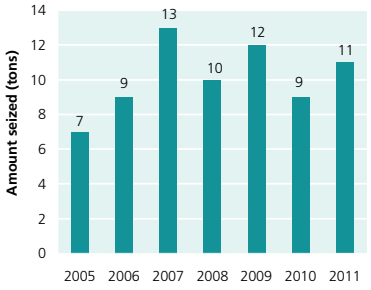
Seizures of amphetamine, mostly Captagon, rise in the Near and Middle East

Near and Middle East seizures account for almost 64 per cent of global amphetamine seizures. Unlike any other region of the world, amphetamine is seized in the Near and Middle East in the form of Captagon pills. In 2011, significant increases were reported by Jordan, Kuwait, Qatar, Saudi Arabia and the Syrian Arab Republic. All the seizures were of Captagon pills. The three largest seizures in 2011 were made by Saudi Arabia and involved 720 kg, 705 kg and 666 kg seized in Haditha, Saudi Arabia, at the land border with Jordan.[99] Most amphetamine seizures are made in Saudi Arabia. In 2011, 11 tons were seized, which represents 37 per cent of global amphetamine seizures and 58 per cent of seizures made in the Near and Middle East.

98 Nimetazepam is a benzodiazepine derivative, controlled in Schedule IV of the Convention on Psychotropic Substances of 1971, often marketed under the brand name Erimin.

99 World Customs Organization, *Customs and Drugs Report 2011* (Brussels, 2012).

Fig. 76. Amphetamine seizures in Saudi Arabia, 2005-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

The changing faces of illicit manufacture of amphetamine-type stimulants

Traditional precursors are being replaced with alternate precursors and chemically modified precursors that are not under international control. For the manufacture of amphetamines, for example, the non-scheduled bisulfite adduct of the essential amphetamine precursor 1-phenyl-2-propanone (P-2-P)[100] has been seized in several European countries in recent years in the form of a white powder that can be converted to form liquid P-2-P with relative ease. *Alpha*-phenylacetoacetonitrile (APAAN), a direct precursor of P-2-P, is a non-controlled substance

100 P-2-P is also known as benzyl methyl ketone (BMK).

Table 5. Seizures of methylamine in Mexico, December 2011

Date	Seizure (tons)	Arriving from	Seized in	Bound for
08.12.11	205	China	Michoacán Port of Lazaro Cardenas	Guatemala Port of Quetzal
09.12.11	23	Turkey	Colima Port of Manzanillo	Guatemala Port of Quetzal
16.12.11	43	China	Baja California	Mexico Obregon, Sonora State
19.12.11	100	China	Michoacán Port of Lazaro Cardenas	Guatemala Port of Quetzal
23.12.11	229	China	Michoacán Port of Lazaro Cardenas	Guatemala Port of Quetzal
26.12.11	21	Peru	Colima Port of Manzanillo	Guatemala Port of Quetzal
28.12.11	120	China	Michoacán Port of Lazaro Cardenas	Guatemala Port of Quetzal

Source: Mexico, Navy Secretariat, 2011.

Note: Mexico regional information: Baja California (north); Colima (south-west); Michoacán (south-west); and Sonora (north-west).

which can easily be converted into P-2-P. APAAN was originally discovered in a large scale methamphetamine manufacturing laboratory in Malaysia in 2006 and, since 2009, has been seized in Belgium, the Netherlands, Poland and Turkey. In Poland, 700 kg of APAAN were seized in April 2011. The Netherlands reported the seizure of several laboratories where APAAN was being converted to P-2-P.

Another chemical that is widely used in illicit ATS manufacture and which is not under international control is methylamine which, together with phenylacetic acid or P-2-P, can be used in the illicit manufacture of methamphetamine, or may also be used in MDMA manufacture, together with (3,4-MDP-2-P). In 2011, a total of 1,400 tons of chemicals used to make methamphetamine were confiscated by customs authorities in Mexico. Seven seizures, comprising 741 tons of methylamine, were reported in December 2011. Six of them were intended to be shipped onwards to Guatemala, which seized large volumes of precursor chemicals in 2011 and 2012.

In January 2012, 195 tons of methylamine were seized in Mexico, marking the first attempt to traffic precursor chemicals from Mexico to Nicaragua and a repeated attempt of trafficking to Guatemala. These seizures may point to increased manufacturing activity in Central America and a rising influence of Mexican drug trafficking organizations in the synthetic drugs market within the region.

The increasing appearance of non-controlled "pre-precursor" substances, many of which have few known legitimate uses other than for the manufacture of controlled precursors, is expected to be a continuing trend in global seizures; this presents a myriad of new challenges for drug control authorities.

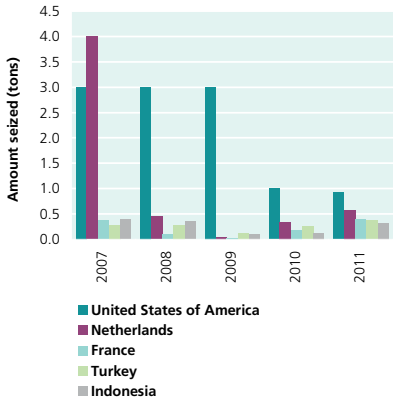
For instance, for "ecstasy" manufacture, methyl 3-[3'4'-(methylenedioxy)phenyl]-2-methyl glycidate (MMDMG, also known as PMK-glycidate) is an alternative to the internationally controlled precursor 3,4-MDP-2-P), also known as piperonyl methyl ketone (PMK). MMDMG, which is not under international control, was first detected in Australia in 2004 and is made from piperonal, which is a precursor of 3,4-MDP-2-P. In May 2010, a small quantity of MMDMG was found in an "ecstasy" and methamphetamine laboratory in the Netherlands along with instructions for its conversion into 3,4-MDP-2-P for "ecstasy" manufacture. In October 2010, authorities in Slovakia seized 200 kg of chemicals, which were a mixture of 3,4-MDP-2-P, piperonal and MMDMG. In March 2011, Denmark seized 800 kg of MMDMG from an air cargo shipment that was reportedly one in a series of shipments destined for the Netherlands and had originated in China.[101] One conversion laboratory, where MMDMG was being converted to PMK, was seized in the Netherlands in 2011. MMDMG has also reportedly appeared in Belgium, Estonia and Poland.

After a decline, "ecstasy" seizures show a rise in 2011 in Europe

In 2011, the largest seizures of "ecstasy"-type substances were reported in Europe, showing an increase from 1.3 tons in 2010 to 1.7 tons in 2011, surpassing the level of seizures in the Americas, which totalled 1.2 tons in 2011. Seizures in North America declined; in the United States from 1 ton in 2010 to 926 kg in 2011 and in Canada from 529 kg in 2010 to 192 kg in 2011. At the global level, the United States reported the highest seizures of "ecstasy"-type substances with 926 kg seized in 2011, followed by Netherlands with 583 kg and France with 409 kg. There were signs of a partial recovery of the "ecstasy" market in 2011, particularly in France where seizures increased from 180 kg in 2010 to 409 kg in 2011 and in the Netherlands with seizures of 343 kg in 2010 and 583 kg in 2011.

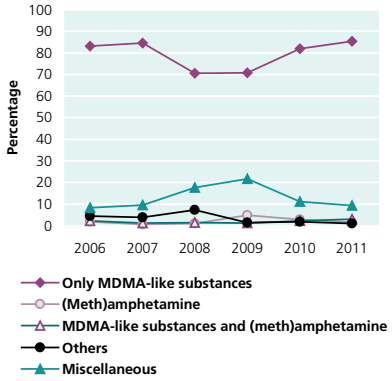
101 *Precursors and Chemicals Frequently Used in the Illicit Manufacture of Narcotic Drugs and Psychotropic Substances: Report of the International Narcotics Control Board for 2011.*

Fig. 77. "Ecstasy" seizures in selected countries, 2007-2011



Source: UNODC, data from the annual report questionnaire and other official sources.

Fig. 78. Content of pills sold as "ecstasy" in the Netherlands, based on laboratory analyses, 2006-2011



Source: Netherlands Institute of Mental Health and Addiction (Trimbos Institute), Drugs Information and Monitoring System.

Note: Data for 2011 are from January to June. Category "others" may include samples with MDMA and, for instance, caffeine and other pharmacologically active non-scheduled substances. In 2009 the miscellaneous category consisted mainly of mCPP (11.60 per cent) and mephedrone (7.4 per cent); in 2010 and 2011 this category consisted mainly of mCPP and caffeine.

Turkey has emerged as a major "ecstasy" seizing country, with the quantities being intercepted slowly increasing over the past decade, reaching a peak of 1.7 million "ecstasy" tablets (474 kg) in 2005. After experiencing a decline in subsequent years until 2009, seizures started to increase from 251 kg in 2010 to 370 kg in 2011. In 2011, Brazil reported the highest seizures of "ecstasy" since 1987 amounting to 70 kg; in the past decade, most annual seizures reported by Brazil were below 1 kg.

There has been a decline in the number of "ecstasy" laboratories seized on a global level from 50 in 2009 to 43 in 2010 and 39 in 2011. The shift in manufacturing activity from Europe to other regions is illustrated by the increasing geographical spread; "ecstasy" manufacture was reported by Australia (16) Indonesia (6), Malaysia (6), the United States (5), Canada (4), France (1) and Belgium (1).

Pills sold as "ecstasy" frequently contain other substances

A large proportion of seized drugs marketed on the street as "ecstasy" continue to contain substances other than MDMA. Amphetamines, for example, are common in pills analysed in Luxembourg, Spain and Turkey, according to reports from EMCDDA and Europol.[102] In most cases, however, these are NPS, that is, substances that are not controlled under the 1961 or 1971 Conventions. Ketamine, for example, is frequently sold as "ecstasy" in markets in East and South-East Asia. Many countries in Europe, on the other hand, report that mCPP, alone or with other substances, was identified in 20 per cent or more of the pills analysed in Austria, Belgium, Croatia, the Czech Republic, Cyprus, Denmark, Finland, Portugal and the United Kingdom.

In New Zealand, 4-methylethcathinone (4-MEC) is reportedly the most common substance identified in pills sold as "ecstasy". Forensic analysis of seizures of "ecstasy"-type street pills and powder used in their manufacture seized during the dismantling of a large-scale pill manufacturing facility and supply ring in 2011 and a related facility in 2012, identified 4-MEC, 3,4-methylenedioxy-α-pyrrolidinobutyrophenone (MDPBP), eutylone (*bk*-EBDB), *N*-ethylamphetamine, *N*-ethylcathinone, BZP and 1-(3-trifluoromethylphenyl)piperazine (TFMPP).

For more than 15 years, the Drugs Information and Monitoring System in the Netherlands has carried out laboratory analyses of pills sold as "ecstasy" and results show the significant developments that the "ecstasy" market has undergone over the years. A review of the composition of sampled pills over the past six years clearly indicates that the proportion of pills containing only MDMA-like substances increased in 2010 and 2011, from 82 per cent to 85 per cent, after the MDMA content reached the lowest levels in 2008 and 2009 (70 per cent in both years), probably because the precursor chemicals for "ecstasy" were difficult to obtain at that time. Mirroring the trends in other countries of the European Union, *m*CPP was also one of the most widely reported substances in pills sold as "ecstasy" in the Netherlands, but the number of mentions declined from 2010 to 2011, from 5 to 4 per cent. The

102 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis.*

same is true for mephedrone, where the proportion dropped from 1 to 0.3 per cent from 2010 to 2011. The substance paramethoxymethamphetamine (PMMA) was also identified in a number of "ecstasy" pills sold in the Netherlands, with the presence of PMMA remaining largely stable (reported 29 times (1.2 per cent) in 2010 and 23 times (0.9 per cent) in 2011). This substance has gained notoriety by its presumed link to several fatalities in Canada and Scotland (United Kingdom). The review conducted in the Netherlands showed the benefits of continuous laboratory analyses, which provide valuable insights into the dynamics of ATS markets.

Table 6. Substances frequently found in pills sold as "ecstasy"

Substance	Americas	Asia	Europe	Oceania
4-MEC				●
Amphetamine			●	
BZP			●	●
Caffeine			●	●
bk-EBDB				●
Ketamine		●		
*m*CPP			●	
MDPBP				●
Mephedrone			●	●
Methamphetamine		●		
N-ethylamphetamine				●
N-ethylcathinone				●
PMMA	●		●	
TFMPP				●

Source: UNODC, data from the annual report questionnaire and other official sources.

Methamphetamine trafficking from West Africa to East and South-East Asia continues

West Africa, a region not previously known for ATS, has gained increased prominence as a point of origin of methamphetamine trafficked to East and South-East Asia. In a UNODC report on the ATS situation in West Africa, methamphetamine was shown to have been trafficked from Benin, Côte d'Ivoire, the Gambia, Ghana, Guinea, Mali, Nigeria, Senegal and Togo.[103]

African drug trafficking organizations, which used to traffic primarily cocaine and heroin, are trafficking increasing amounts of methamphetamine in East and South-East Asia, usually by air courier and in fairly small quantities (between 0.5 kg and 3.0 kg). Asia is a prime location due to the size of its ATS market, which is one of the largest in the world, and due to the high prices that methamphetamine can command. In Japan, one kilogram of methamphetamine retails for at least $212,600. EMCDDA and Europol report that West African criminal organizations also use major airports in the European Union to traffic methamphetamine manufactured in Africa to the Asian markets and that they recruit couriers in the European Union. Australia and New Zealand have also reported the increasing role of West African organized criminal groups in trafficking of ATS and ATS precursors to Australia and New Zealand.

Trafficking of methamphetamine by African groups has been reported by Brunei Darussalam, Cambodia, China, Indonesia, Japan, the Lao People's Democratic Republic, Malaysia, New Zealand, the Philippines, the Republic of Korea, Thailand and Viet Nam.

Nigeria, by far the largest country in West Africa in terms of both population and surface area, and Benin have been most frequently cited as the origin for trafficked methamphetamine. Mali has reportedly also emerged as a source. The Republic of Korea reported that in 2011, more than 4 kg of methamphetamine were smuggled into the country from Mali.[104]

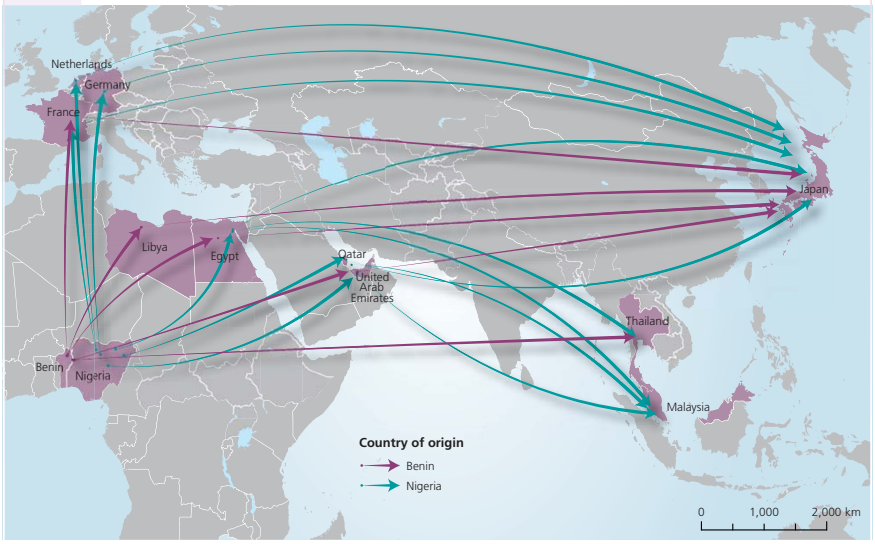
In July 2011, Nigeria became the first and, so far, only country in West Africa to officially report illicit methamphetamine manufacture. The National Drug Law Enforcement Agency seized a methamphetamine laboratory with a reported manufacturing capacity of between 25 and 50 kg per manufacturing cycle near Lagos, Nigeria's largest city. Several laboratories were seized in 2012.

There is a persistent lack of data from the African region, which can be seen from the scarce reporting of seizures of ATS and their precursors due to a general lack of awareness of ATS, as law enforcement authorities tend to focus on the interception of "traditional" drugs such as cannabis and cocaine.

103 UNODC, *West Africa: 2012 ATS Situation Report—A Report from the Global SMART Programme* (Vienna, June 2012).

104 Information provided by the Supreme Prosecutors' Office of the Republic of Korea at the seventeenth Asia-Pacific Operational Drug Enforcement Conference, Tokyo, February 2012.

Map 6. Methamphetamine trafficking routes from Benin and Nigeria to East and South-East Asia



Source: Japan, National Police Agency, 2012; Thailand, Office of the Narcotics Control Board, 2012; and Malaysia, Royal Malaysian Police, 2012.

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. Dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined.

G. CONCLUSIONS

While the prevalence of people with drug dependence and drug use disorders has generally remained stable, there are many regions where evidence-based drug dependence treatment and care are still not available or accessible.

The decline in the global number of people who inject drugs and people who inject drugs and are living with HIV is in part due to the comprehensive set of interventions implemented by some countries. This holds the promise that with an increased coverage and scale up of services for prevention of HIV among people who inject drugs, the targets set out in the Political Declaration on HIV and AIDS: Intensifying Our Efforts to Eliminate HIV and AIDS adopted by the General Assembly in 2011, can be attained. It has to be noted, however, that to a large extent the decline is also due to new or revised estimates available from countries.

The emergence of NPS, increasing non-medical use of prescription drugs and polydrug use continue to blur the conventional distinction between users of one or another illicit substances. The interdependency at the user level, for instance, of illicit opiates (opium, morphine and heroin) on the one hand, and non-medical use of prescription opioids like painkillers and illicitly manufactured opioids on the other, has not been well understood. Further research is needed to understand this phenomenon in order to devise comprehensive approaches to address the problem.

The latest drug trafficking trends show that Africa is a vulnerable transit continent for both cocaine and heroin. While West and Central Africa have already witnessed increased cocaine trafficking during the past few years, East Africa is fast emerging as a transit route for Afghan opiates destined for the European market. West Africa is also emerging as a hub for methamphetamine production. The spillover effect of the increased trafficking of drugs through Africa on drug use in African countries is a matter of concern, although to study and document it remains a challenge due to weak data collection mechanisms and processes.

Despite the fluctuations in opiate production in Afghanistan, the global opiate market remains relatively stable. Changes though are being observed at the regional level. Heroin is losing ground in Western Europe, but the recent information from Asia and Africa, albeit limited, indicates a possible increase in opiate use.

Despite the relative stability of the established cocaine markets, there are indications that cocaine is being trafficked

along new routes to cater for the growing demand from emerging markets. Cocaine use in Asia and Africa, which together account for a majority of the world population, has the potential to grow. Moreover, the extent of the phenomenon in these regions is uncertain, possibly due in part to the common perception of it being a relatively small-scale problem. In order to pre-empt an expansion of the cocaine market on these continents, greater attention must be paid to monitoring the use and the availability of this drug, so that appropriate and evidence-based supply and demand side interventions may be deployed.

The market for ATS appears to be expanding in terms of locations of manufacture and trafficking routes, as well as in terms of demand. While ATS use currently remains stable, this may change as a result of possible spillover of ATS to previously unaffected regions and countries. The global emergence of NPS has introduced an added layer of complexity to an already complex market, with an almost unlimited variety of substances that are being sold in a number of different forms.

The manufacture of ATS is not limited by the necessity for cultivation of large areas of illicit crops under special climactic conditions, and therefore can potentially spring up anywhere, especially in the case of drugs such as methamphetamine which are relatively easy to manufacture. Therefore, emerging ATS and other drug markets need to be monitored and addressed proactively before they are established and become a significant additional challenge for already strained national health and criminal justice systems.

Cannabis herb production has become more localized and more countries report increased domestic cultivation for domestic markets. The trend towards small-scale cultivation for personal consumption continues and poses a number of challenges for policymakers. A variety of systems to regulate cannabis supply exist in Member States (e.g., decriminalization under a certain threshold and regulation of supply for specific, medicinal purposes). Very little is known about the efficiency of these systems in terms of supply regulation or their impact on use trends and patterns. Further research is warranted before any conclusions can be drawn for the international drug control system.

Maritime trafficking of drugs can be quite lucrative for traffickers who can invest both the time and the money needed to organize large, high-value shipments to lucrative consumer markets, either under the cover of licit, containerized trade or in unregulated traffic over the open seas and waterways. Such shipments can be difficult to intercept, but an intensified focus on this mode of transportation could result in a significant impact in terms of seizure quantities and interception rates, the consequent risk incurred by traffickers, the price of the drug and ultimately, its accessibility in the consumer markets.

Gaps in availability of reliable data on all aspects of the drug phenomenon from many regions continue to limit the understanding of the drug market dynamics, posing further challenges for the drug control mechanisms and for the development of appropriate prevention and treatment interventions.

2 NEW PSYCHOACTIVE SUBSTANCES

A. INTRODUCTION

The use of new psychoactive substances (NPS), i.e. psychoactive substances not under international control that pose a health threat, has grown rapidly over the past decade,[1] in contrast to the prevalence rates for the use of internationally controlled drugs, which seem generally to have stabilized in the same time period.[2] Producing and marketing such substances holds the promise of high profits without penalty. When brought under control in one country, production and/or the distribution centres of these substances are shifted to another country so that the sales - often conducted via the Internet - can continue. In other cases, the substances are modified slightly so that they are not covered by the respective country's legislation. The number of NPS reported by Member States to UNODC rose from 166 at the end of 2009 to 251 by mid-2012. This exceeds the total number of psychoactive substances currently controlled by the international drug conventions (234 substances).

The present chapter describes a number of approaches that Member States are using to tackle this issue. It has generally been observed that placing a substance under control reduces consumption of that substance, but the market quickly evolves and other NPS emerge, rapidly filling the void created. It is thus clear that a strategy that is comprehensive, proactive, dynamic and global (to prevent the exploitation of loopholes) is required to deal with these challenges.

An ever-increasing number of NPS have emerged worldwide over the past few years, prompting responses at the international level (e.g. Commission on Narcotic Drugs resolution 48/1) as well as at the regional level, such as the Council of the European Union decision on the information exchange, risk assessment and control of new psychoactive substances.[3]

In 2012, in its resolution 55/1, the Commission on Narcotic Drugs expressed its deep concern about "reports of the increased and emerging use of and trade in new psychoactive substances that may have effects similar to those of internationally controlled drugs" and about "the potential opportunities for transnational organized criminal groups to exploit the market for these substances". It also asked UNODC to gather information and report on the problem.

In 2013, in its resolution 56/4, the Commission on Narcotic Drugs recognized that "the establishment of a global early warning system, taking advantage of existing regional mechanisms, as appropriate, and providing timely reporting on the emergence of new psychoactive substances, could benefit Member States' understanding of and responses to the complex and changing market for these substances". The Commission on Narcotic Drugs also urged UNODC "to continue to develop the voluntary electronic portal of the international collaborative exercises, a programme for national forensic and/or drug-testing laboratories to enable timely and comprehensive sharing of information on new psychoactive substances, including analytical methodologies, reference documents and mass spectra, as well as trend-analysis data, with a view to providing a global reference point and early warning advisory on new psychoactive substances". It further requested UNODC to consider including within its programmes the provision of technical assistance in the identification and reporting of new psychoactive substances and for Member States to consider the provision of bilateral technical assistance.

Well-known examples of NPS include substances such as synthetic cannabinoids contained in various herbal mixtures, piperazines (e.g. N-benzylpiperazine (BZP)), products sold as "bath salts" (i.e. cathinone-type substances such as mephedrone and methylenedioxypyrovalerone (MDPV)) and various phenethylamines. Ketamine was among the first NPS to appear. Its abuse was first recognized in North America at the beginning of the 1980s. It became a noticeable phenomenon in Europe in the 1990s,[4] before spreading extensively in Asia and, to a lesser extent, in South America and Southern Africa. NPS belonging to the phenethylamine family appeared in the market in the 1990s and substances belonging to the piperazine family at the beginning of the 2000s.[5] From 2004 onwards, synthetic cannabinoids such as Spice appeared in the market, followed by synthetic cathinones and other emerging groups of NPS.[6]

In addition to having serious health consequences, NPS pose a challenge to drug control systems at every level — national, regional and global. A number of approaches are

1 *Report of the International Narcotics Control Board for 2012* (United Nations publication, Sales No. E.13.XI.1).

2 *World Drug Report 2012* (United Nations publication, Sales No. E.12.XI.1).

3 Council of the European Union decision 2005/387/JHA of 10 May 2005 on information exchange, risk-assessment and control of new psychoactive substances (*Official Journal of the European Union*, L 127, 20 May 2005). Available from http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2005:127:0032:0037:EN:PDF.

4 European Monitoring Centre for Drugs and Drug Addiction, *Report on the Risk Assessment of Ketamine in the Framework of the Joint Action on New Synthetic Drugs* (Luxembourg, Office for Official Publications of the European Communities, 2002).

5 For instance, BZP was first sold commercially as an alternative to methamphetamine in New Zealand around 2000. T. Bassindale, "Benzylpiperazine: the New Zealand legal perspective", *Drug Testing and Analysis*, vol. 3, Nos. 7-8 (August 2011), pp. 428-429; BZP reached Europe around 2004, but it was placed under control in the countries of the European Union only in 2007.

6 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

being tried at the national and regional levels to address the issue. They range from temporary and emergency drug control measures in response to an imminent threat to public health to the adoption of various pieces of legislation on consumer protection, medicines and hazardous substances in order to prevent the uncontrolled manufacture, trafficking and harmful use of such substances.

The issue of NPS gained in importance at the international level at the fifty-fifth session of the Commission on Narcotic Drugs in March 2012, where the first global consensus on the topic emerged, leading to the adoption of Commission resolution 55/1 on promoting international cooperation in responding to the challenges posed by new psychoactive substances. In its resolution, the Commission called on Member States to monitor emerging trends in the composition, production and distribution of new psychoactive substances and patterns of use, and to share that information and adopt appropriate measures aimed at reducing supply and demand. Also in its resolution, the Commission requested UNODC to provide an update to its 2011 report "addressing a wider range of new psychoactive substances … and to take into consideration the creation of a compilation of new psychoactive substances encountered by Member States, to serve as an early warning advisory". The requested report on NPS was prepared by UNODC and launched at the fifty-sixth session of the Commission, held in March 2013.[7] The present chapter of the World Drug Report 2013 draws on the findings of that report and other recent reports on the topic in an attempt to alert an even larger audience to the issues at stake. It has also been prepared pursuant to Commission resolution 56/4, adopted in 2013, in which the Commission encouraged UNODC "to share and exchange ideas, efforts, good practices and experiences in adopting effective responses to address the unique challenges posed by new psychoactive substances, which may include, among other national responses, new laws, regulations and restrictions".

B. NEW PSYCHOACTIVE SUBSTANCES: CONCEPTS AND DEFINITIONS

The creation of new substances to exploit loopholes in drug control legislation has been a problem since the international drug control system was first established. The proliferation of such substances in recent decades was influenced by the work done by Ann and Alexander Shulgin on phenethylamines[8] and tryptamines[9] in the 1960s and the 1970s. The Shulgins reported over 230 psychoactive compounds that they had synthesized and evaluated for their psychedelic and entactogenic potential. More recently, a number of piperazines, synthetic cathinones and synthetic cannabinoids emerged, which were marketed as "legal" alternatives to controlled substances.

1. Analogues versus mimetics

One can distinguish between chemical analogues (i.e. structural derivatives of a parent component that often differ from the original by just one or a few chemical modifications) and so-called mimetics (i.e. substances that are chemically different but mimic the pharmacological effects of a particular substance, notably by acting on the same receptors in the brain). Most phenethylamines and tryptamines described in the work of the Shulgins are analogues of a limited number of substances. An analogue, even though very similar chemically, may not have the same pharmacological properties as the original compound. Thus, MDMA, commonly known as "ecstasy", is an analogue of methamphetamine, although the pharmacological properties of the two are quite distinct. The synthetic cannabinoids found in Spice, on the other hand, are mimetics of THC, the main psychoactive substance in cannabis. While quite different in their chemical structure, such substances act on the same cannabinoid receptors as does THC and have produced effects similar to those produced by cannabis. Over the years, Governments have developed various approaches to deal with such analogues and mimetics, which were designed to circumvent existing controls.

There is a third, novel group of substances emerging, which interfere with the signalling pathways in the body to produce or enhance the effects associated with analogues or mimetics. These substances are not psychoactive per se. However, they prompt the body to produce the psychoactive substances wanted by the users (or slow down the degradation of those substances in the brain, thus leading to their accumulation).[10] Given that this is a recent phenomenon, existing legislation in most countries seems unable to cope with such substances.

A number of concepts and definitions for psychoactive substances have been developed and are marketed as a way to avoid legal sanctions. The past few decades have seen terms such as "designer drugs" (1980s and 1990s) and "legal highs" (the past decade) gain currency. The concept of "NPS" is the latest in that series. Although all these concepts share many characteristics, they are inherently different and can be distinguished from each other.

7 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

8 Alexander Shulgin and Ann Shulgin, PiHKAL (*Phenethylamines I Have Known and Loved): A Chemical Love Story* (Berkeley, California, Transform Press, 1991).

9 Alexander Shulgin and Ann Shulgin, TiHKAL (*Tryptamines I Have Known and Loved): The Continuation* (Berkeley, California, Transform Press, 1997).

10 For example, URB597 is a selective inhibitor of fatty acid amide hydrolase (FAAH), the degradatory enzyme for anandamide, an endogenous cannabinoid neurotransmitter. Use of URB597 causes the accumulation of anandamide, which plays a role in the neural generation of motivation and pleasure.

2. Designer drugs and related concepts

Designer drugs

"Designer drugs" have been defined by the International Narcotics Control Board as follows:

Substances that have been developed especially to avoid existing drug control measures … [and] are manufactured by making a minor modification to the molecular structure of controlled substances, resulting in new substances with pharmacological effects similar to those of the controlled substances.

According to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and the European Police Office (Europol), such substances can be best defined as substances designed to mimic the effects of known drugs by slightly altering their chemical structure in order to circumvent existing controls.

Source: *Report of the International Narcotics Control Board for 2010* (United Nations publication, Sales No. E.11.XI.1), p. vi.; and European Monitoring Centre for Drugs and Drug Addiction (EMCDDA) and European Police Office, "EMCDDA-Europol 2011 annual report on the implementation of Council decision 2005/387/JHA" (Lisbon, 2012).

The term "designer drug" was coined in the 1980s. It originally referred to various synthetic opioids, mostly based on modifications of fentanyl (e.g. *alpha*-methylfentanyl). The term entered widespread use when MDMA ("ecstasy") experienced a boom in the mid-1980s, first in the United States of America, followed by Europe in the 1990s and then in other parts of the world. Once MDMA was scheduled (in the United States in May 1985 and a year later at the global level), a number of chemically related substances appeared on the drug markets, which were labelled "designer drugs" because they were related to MDMA but fell outside the drug control system.[11] Many more "designer drugs" were controlled at the national level. So, the term "designer drug" for substances already under control was not really appropriate. Nonetheless, use of the term persisted, although in some circles it was later replaced by the term "club drugs". However, the term "club drugs" encompasses a far broader range of controlled and non-controlled substances.[12]

Another term that emerged in the late 1990s and early 2000s is "research chemicals". The term was coined by some marketers of designer drugs, specifically, marketers of psychedelic drugs (i.e. drugs with hallucinogenic properties) in the tryptamine and phenethylamine families. The idea was that by selling the chemicals for so-called "scientific research" rather than for human consumption, the intent clause of various analogue drug laws could be circumvented altogether. The same strategy was behind the marketing of some of the cathinone-related substances as "bath salts" not intended for human consumption.

3. "Legal highs"

"Legal highs"

"Legal highs" is an umbrella term for unregulated (new) psychoactive substances or products intended to mimic the effects of controlled drugs. The term encompasses a wide range of synthetic and/or plant-derived substances and products, which are offered as "legal highs" (emphasizing the idea of legality), "research chemicals" (implying legitimate research use), "party pills" (an alternative to "party drugs") and "herbal highs" (stressing the plant origin) etc. They are frequently sold via the Internet or in "smart shops" or "head shops" and in some cases are intentionally mislabelled, with purported ingredients differing from the actual composition.

Source: European Monitoring Centre for Drugs and Drug Addiction and European Police Office, "EMCDDA-Europol 2011 annual report on the implementation of Council decision 2005/387/JHA" (Lisbon, 2012), p. 25.

There are a number of new - and thus non-controlled - synthetic substances emerging every year on the drug markets, which are sold as "legal highs". Well-known examples in the past decade were the spread of BZP, mephedrone and the synthetic cannabinoids. In addition, a number of plant-based substances gained popularity in the new millennium, including kratom (leaf of *Mitragyna speciosa*, grown in South-East Asia, a mild stimulant that stimulates the opiate receptors in the brain and is a sedative at higher doses) and *Salvia divinorum*, a hallucinogen grown in Mexico.

Substances sold as "legal highs" are mainly manufactured in chemical laboratories in Asia, according to the International Narcotics Control Board[13] and the European Police Office (Europol),[14] although some manufacture also takes place in Europe, the Americas and other regions.[15] They

11 Eventually, several of these "ecstasy"-type substances got scheduled as well (e.g. methylenedioxyamphetamine (MDA) and methylenedioxyethylamphetamine (MDE) at the international level in 1990). Etryptamine was placed under control in 1995. *Alpha*-Methyl-4-methylthiophenethylamine (4-MTA) and 4-bromo-2,5-dimethoxyphenethylamine (2C-B), one of the designer drugs first synthesized by Alexander Shulgin in the 1970s, were scheduled in 2001.

12 The term refers to substances used by teenagers and young adults at bars, nightclubs, concerts and parties. According to the United States National Institute on Drug Abuse, such "club drugs" include "ecstasy" and related substances (both controlled and non-controlled), methamphetamine (a controlled stimulant), gamma-hydroxybutyric acid (GHB) (a depressant), flunitrazepam (a benzodiazepine (Rohypnol)), lysergic acid diethylamide (LSD) (a hallucinogen) and ketamine.

13 *Report of the International Narcotics Control Board for 2012.*

14 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis* (Luxembourg, Publications Office of the European Union, 2013).

15 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

are legally imported, either as chemicals or as packaged products. The "legal highs" market is characterized by the speed with which suppliers circumvent drug controls by offering new alternatives to restricted products and advertise them with aggressive and sophisticated marketing strategies (as air fresheners, herbal incenses, bath salts, plant fertilizers, collectors' items etc.).[16] In fact, the term "legal high" is a successful marketing instrument in and of itself, as it implies that these substances are not as dangerous as controlled drugs, thus boosting their popularity and sales. Substances presented as "legal highs" often also include drugs controlled in some countries.

According to Oxford Dictionaries Online,[17] a "legal high" is "a substance with stimulant or mood-altering properties whose sale or use is not banned by current [national] legislation". This means, as an *argumentum e contrario*, that by controlling a substance under the national drug laws, such a substance ceases to be a "legal high". As a number of countries placed substances such as BZP, mephedrone and Spice under control, such substances were in fact no longer "legal highs" in those countries, while continuing to be "legal highs" in others. That legislative inconsistency across jurisdictions often hampers any meaningful international discussion on the issue, as interlocutors from different jurisdictions may not even be referring to the same substances when they refer to "legal highs".

4. New psychoactive substances

To better serve policymaking at the regional and international levels, the term "new psychoactive substances" or NPS was coined. The Commission on Narcotic Drugs introduced this term at the international level in its resolution 55/1 of 16 March 2012.

The term "new psychoactive substances" had been legally defined earlier by the European Union as a new narcotic or psychotropic drug, in pure form or in a preparation, that is not scheduled under the Single Convention on Narcotic Drugs of 1961 or the Convention on Psychotropic Substances of 1971, but which may pose a public health threat comparable to that posed by substances listed in those conventions (Council of the European Union decision 2005/387/JHA).

That legal definition is now widely used and has also been adopted by the EMCDDA.[18]

On the basis of that definition, EMCDDA identified the following groups of substances covered by its early warning system on NPS:[19]

- *Phenethylamines*, which encompass a wide range of substances that may exhibit stimulant, entactogenic or hallucinogenic effects
- *Tryptamines*, which include a number of substances that have predominantly hallucinogenic effects
- *Piperazines*, which are represented, inter alia, by *m*-chlorophenylpiperazine (*m*CPP) and BZP, both of which are central nervous system stimulants
- *Synthetic cathinones*, which have stimulant effects. The main cathinone derivatives are the semi-synthetic methcathinone and the synthetic compounds mephedrone, methylone and MDPV
- *Synthetic cannabinoids* are functionally similar to THC, the active compound of cannabis
- Other substances reported to the early warning system include various plant-derived and synthetic psychoactive substances (e.g. indanes, benzodifuranyls, narcotic analgesics, synthetic cocaine derivatives, ketamine and phencyclidine derivatives), which do not strictly belong to any of the above-mentioned drug families. Also included are a number of medicinal products and derivatives.

In the operating guidelines on the early warning system, EMCDDA made it explicit that "the term 'new' did not refer to newly invented, but rather 'newly misused'" substances as "most of the drugs in question were first created many years ago."[20] In fact, investigations into the potential use of piperazines as anthelmintic have been reported in scientific literature since the early 1950s.[21] Yet they only started to emerge as a health problem in several countries in the decade 2001-2010. Similarly ketamine, which was first developed in the mid-1960s, started to emerge as a health problem in that decade in several countries of East and South-East Asia. Mephedrone was first synthesized in 1929 but was rediscovered only in 2003 and reached the markets towards the end of the decade 2001-2010.[22]

NPS also include plant-based substances that have existed for centuries. In the profiles of "new drugs", EMCDDA lists plant-based substances such as *Salvia divinorum* and

16 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, "EMCDDA-Europol 2011 annual report on the implementation of Council decision 2005/387/JHA" (Lisbon, 2012), p. 25.

17 Oxford Dictionaries. Available from http://oxforddictionaries.com/definition/english/legal%2Bhigh.

18 European Monitoring Centre for Drugs and Drug Addiction, "Responding to new psychoactive substances", *Drugs in Focus*, No. 22, 2011.

19 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, "EMCDDA-Europol 2011 annual report on the implementation of Council decision 2005/387/JHA", p. 27.

20 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *Early-Warning System on New Psychoactive Substances: Operating Guidelines* (Luxembourg, Office for Official Publications of the European Communities, 2007), p. 11.

21 R.H.R. White and O. Standen, "Piperazine in the treatment of threadworms in children", *British Medical Journal*, vol. 2, No. 4839 (3 October 1953), pp. 755-757; O. Standen, "Activity of piperazine, in vitro, against *Ascaris lumbricoides*", British Medical Journal, vol. 2, No. 4930 (2 July 1955), pp. 20-22.

22 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *Early-Warning System on New Psychoactive Substances: Operating Guidelines.*

khat. Khat has been known for hundreds of years in the countries around the Horn of Africa and the southern parts of the Arabian peninsula. However, it is considered to be a new substance in a number of European and American countries, as its use was barely known in those regions until one or two decades ago. The same applies to *Salvia divinorum*, kratom, and various hallucinogenic mushrooms, which are all considered to be NPS.[23] Using the definition "newly misused on the market", the overwhelming number of non-controlled psychoactive substances can be regarded as NPS, as there will always be some countries in which they have not been misused before.

UNODC has basically followed the definition and interpretation of "new psychoactive substances" used by EMCDDA.

United Nations Office on Drugs and Crime definition of new psychoactive substances

New psychoactive substances (NPS) are substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat. In this context, the term "new" does not necessarily refer to new inventions but to substances that have recently become available.

Source: United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

Substances categorized as NPS according to the UNODC classification include:

- Synthetic cannabinoids
- Synthetic cathinones
- Phenethylamines
- Piperazines
- Ketamine
- Plant-based psychoactive substances such as kratom (*Mitragyna speciosa*), *Salvia divinorum* and khat (*Catha edulis*)
- Other substances, including
  - Tryptamines
  - Aminoindanes
  - Phencyclidine-type substances.

However, the most widespread psychoactive substances worldwide - alcohol, nicotine and caffeine - are not included in this list.

23 European Monitoring Centre for Drugs and Drug Addiction, "Online sales of new psychoactive substances/'legal highs': summary of results from the 2011 multilingual snapshots — Briefing paper" (Lisbon, 15 November 2011), p. 6.

5. Pharmacological properties of new psychoactive substances

The products under the heading of NPS include a broad range of substances with different chemical and pharmacological properties. Attempts to summarize their pharmacological properties must be treated with caution, as each individual substance may have distinct properties. Nonetheless, some general observations can be made. The main health consequences of the most widespread NPS are described below.

(a) Synthetic cannabinoids

The most widely used NPS are currently the synthetic cannabinoids, often mixed with various herbal mixtures and sold under the brand name Spice or other names such as K2, Moon Rocks, Yucatan Fire and Skunk to name just a few.[24] Initially, the most widespread synthetic cannabinoid was JWH-018. After it was prohibited in some countries in 2010, it was immediately replaced by other, similar compounds, such as JWH-073. Although the various synthetic cannabinoids differ,[25] they tend to be more potent than the THC contained in the natural cannabis plant. Similar to cannabis, these substances tend to elevate the mood, aid relaxation and alter perceptions. Negative side effects include increased heart rate, vomiting, agitation, confusion and hallucinations. Synthetic cannabinoids can also raise blood pressure and cause reduced blood supply to the heart (myocardial ischemia), and have, in a few cases, been associated with heart attacks.[26] It appears that in addition to creating psychological disorders,[27] some of these products may also have carcinogenic potential, sometimes related to metabolites of the substances contained in these products.[28]

(b) Phenethylamines

A large number of non-controlled phenethylamines also fall in the category of NPS. However, the main phenethylamines on the illicit markets are already under international control, including amphetamine, methamphetamine and methylphenidate, as well as MDMA ("ecstasy") and mescaline. In some classification schemes, the synthetic cathinones (see below) are also considered to be part of the substituted phenethylamines. The various phenethylamines tend to be stimulants and/or hallucinogens and sometimes also have some entactogenic properties. They mostly affect the dopamine and serotonin systems of the

24 United States, National Institute on Drug Abuse, "DrugFacts: Spice (synthetic marijuana)", December 2012. Available from www.drugabuse.gov/publications/drugfacts/spice-synthetic-marijuana.

25 There is a wide variety of synthetic cannabinoids; it should be noted that they are not limited to the JWH series.

26 National Institute on Drug Abuse, "DrugFacts: Spice (synthetic marijuana)".

27 United Nations Office on Drugs and Crime, "Synthetic cannabinoids in herbal products" (Vienna, 2011), p. 11.

28 Ching Yu Lin and others, "Toxicity and metabolism of methylnaphthalenes: comparison with naphthalene and 1-nitronaphthalene", *Toxicology*, vol. 260, Nos. 1-3 (2009), pp. 16-27.

brain. In low doses, phenethylamines increase alertness, give energy to fatigued individuals and increase endurance. They also tend to have some anorectic properties. In higher doses, they induce euphoria, stronger feelings of self-esteem (including diminished fear, anxiety and insecurity) but can also increase blood pressure, raise body temperature (hyperthermia), increase the heart rate, cause hallucinations and lead to death due to stroke, cardiac arrest and brain damage (starting with memory loss). Their use can entail various forms of drug-related psychosis and paranoia.

The more psychedelic phenethylamines tend to bring about the intensification of bodily senses (hearing, touch, smell, vision, taste) and thus also have some aphrodisiacal effects, and create various hallucinogenic effects even at lower doses, entailing various mental, auditory and visual distortions. Alexander and Anne Shulgin documented the synthesis of some 200 phenethylamines.[29] The number of phenethylamines not under international control exceeds the number of controlled phenethylamines. They include paramethoxymethamphetamine (PMMA) (street names: 4-MMA and methyl-MA) and a number of psychedelic phenethylamines such as 2,5-dimethoxy-4-iodophenethylamine (2C-I), 2,5-dimethoxy-4-methyl-phenethylamine (2C-D) and 2,5-dimethoxy-4-iodoamphetamine (DOI) which, in contrast to 4-bromo-2,5-dimethoxyphenethylamine (2C-B) are not controlled at the international level. PMMA and 4-methylthioamfetamine (4-MTA) have been associated with more incidental deaths than other non-controlled phenethylamines. The former is known to have a particularly high level of toxicity.[30]

(c) Cathinones

Currently, the most problematic group of NPS from the perspective of public safety and health seem to be the synthetic cathinones, such as mephedrone or MDPV.[31] Some of the cathinones are linked to the khat plant (*Catha edulis*), although most are synthetically manufactured. From a chemical and pharmacological perspective, they are stimulants and similar to amphetamines and thus the phenethylamine family. Apart from the desired psychological effects of euphoria and increased alertness, awareness, mental stimulation and increased sociability, synthetic cathinones also share many of the negative side effects of amphetamine-type stimulants, including increased heart rate, tachycardia, hypertension, breathing difficulties, loss of appetite, increased sweating, deterioration of memory, hallucinations, delusions, erratic behaviour, anxiety, paranoia and depression. The main adverse effects reported by users of the various synthetic cathinones include cardiac, psychiatric and neurological problems ranging from mild agitation to severe psychosis.[32] A number of key cathinones are already under international control, including cathine, cathinone[33] and methcathinone, as well as amfepramone and pyrovalerone.[34] The most widely used non-controlled cathinones at the international level include mephedrone[35] (4-methylmethcathinone, often known in the market as "m-cat", "meph", "drone" or "miaow"), methylone ("explosion" or "top cat") and MDPV. The use of MDPV was, in a number of cases, associated with highly bizarre behaviour,[36] including a number of suicides, deaths associated with MDPV delirium[37] and highly violent homicides.[38]

(d) Piperazines

Piperazines are another broad group of substances that fall into the category of NPS. The basic molecule of this group, piperazine, was first introduced in medicine in 1953, for its anthelmintic properties. Some of the most common piperazines with psychoactive properties include BZP, 1-(3-trifluoromethylphenyl)piperazine (TFMPP) and *m*CPP, which is reportedly more widespread than BZP in some regions.[39] BZP is a drug with euphoric and stimulant properties, comparable to those produced by amphetamines and was initially developed as a potential antidepressant drug.[40] In fact, users are often unable to distinguish the effects of BZP from those of d-amphetamine; they report alertness, mood escalation, euphoria and a general

29 Shulgin and Shulgin, *PiHKAL (Phenethylamines I Have Known and Loved): A Chemical Love Story.*

30 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

31 In the United Kingdom of Great Britain and Northern Ireland, for instance, the number of fatalities related to internationally non-controlled synthetic cathinones were far higher than for other new psychoactive substances and exceeded already those related to the amphetamines (see Hamid Ghodse and others, *Drug-related Deaths in the UK: Annual Report 2011* (International Centre for Drug Policy, St. George's, University of London, London, 2012), pp. 95-96).

32 J. M. Prosser and L. S. Nelson, "The toxicology of bath salts: a review of synthetic cathinones", *Journal of Medical Toxicology*, vol. 8, No. 1 (2012), pp. 33-42.

33 Cathinone was discovered in khat and subsequently synthesized in 1974/1975 in the narcotics laboratory of the United Nations (see Kalman Szendrei, "The chemistry of khat", *Bulletin on Narcotics*, vol. XXXII, No. 3 (1980) (United Nations publication), pp. 5-35).

34 Cathinone and methcathinone are listed in Schedule I of the Convention on Psychotropic Substances of 1971, cathine is listed in Schedule II and amfepramone and pyrovalerone are listed in Schedule IV of the same Convention.

35 For a detailed review see European Monitoring Centre for Drugs and Drug Addiction, *Report on the Risk Assessment of Ketamine in the Framework of the Joint Action on New Synthetic Drugs*; see also Paul I. Dargan and others, "The pharmacology and toxicology of the synthetic cathinone mephedrone (4-methylmethcathinone)", *Drug Testing and Analysis*, vol. 3, Nos. 7-8 (July-August 2011), pp. 454-463.

36 "Bath salts abuse", available from http://sober.com/bath-salts.html.

37 B. L. Murray, C. M. Murphy and M. C. Beuhler, "Death following recreational use of designer drug "bath salts" containing 3,4-methylenedioxypyrovalerone (MDPV)", *Journal of Medical Toxicology*, vol. 8, No. 1 (2012), pp. 69-75.

38 Glenn Duncan, Hunterdon Drug Awareness Program, "3,4-methylenedioxypyrovalerone (MDPV) and other synthetic cathinones", 28 January 2013. Available from www.slideshare.net/Guedde/mdpv-bath-salts-emerging-drug-trends; Thomas M. Penders, "How to recognize a patient who's high on 'bath salts'", *Journal of Family Practice*, vol. 61, No. 4 (April 2012), pp. 210-212.

39 European Monitoring Centre for Drugs and Drug Addiction, "BZP and other piperazines", Drug Profiles. Available from www.emcdda.europa.eu/publications/drug-profiles/bzp (accessed September 2012).

40 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

feeling of well-being. BZP was initially marketed in some countries (notably New Zealand) as an alternative to methamphetamine.[41] If combined with TFMPP, effects similar to those of MDMA ("ecstasy") are produced. Thus BZP/TFMPP combinations have been widely used in the club and rave scene in many countries.[42] These substances have been shown to have a mixed mechanism of action, acting both on the serotonin and the dopamine receptor systems, much like MDMA,[43] thus showing entactogenic properties.[44] In contrast to BZP, TFMPP is rarely used on its own. Street names of BZP include "Jax", "A2", "Benny Bear", "Flying Angel", "Legal E", "Legal X", "Pep X", "Pep Love" and "Nemesis".[45] Adverse effects of BZP include repetitive thought patterns, increased heart rate, hypertension, dilation of pupils, nausea, flushing, slight urinary incontinence, chest pain, hallucinations, and - more problematically - confusion, acute psychosis, respiratory failure, renal toxicity and seizures. BZP produces toxic effects similar to those of amphetamines and other sympathomimetics, although, according to studies on animals, its effects are less potent than those of amphetamines, methamphetamines and MDMA.[46] The effects produced by *m*CPP are more like the stimulant and hallucinogenic effects produced by MDMA.[47]

(e) Ketamine

Ketamine (street names: "K", "special K", "kit kat", "tac", "tic", "cat valium", "cat tranquillizer", "vitamin K", "ket", "super K")[48] is also a widespread substance falling within the category of NPS. It was originally developed as a derivative of phencyclidine (PCP), a drug controlled under Schedule II of the 1971 Convention. It is used in veterinary medicine, primarily for the induction and maintenance of general anaesthesia. In human medicine, it is sometimes used to treat depression in patients with bipolar disorder as well as for emergency surgery in war zones. However, it is also widely misused for recreational purposes as a club drug and in raves, notably in South-East Asia (often sold there as "ecstasy", sometimes offered in pills containing both MDMA and ketamine) and, to a lesser extent, in Europe and in the Americas. It produces hallucinatory effects as well as a dissociative state, characterized by a sense of detachment from one's body, similar to the effects produced by phencyclidine. Ketamine produces euphoria, increased energy and a sense of calm and serenity. Misuse can lead to increase in the heart rate, slurred speech, severe confusion, disorientation and shifts in perception of reality (distortion and loss of sensory perceptions). In addition, hypertension and decreased heart rate have been associated with its use. Chronic ketamine use has been reported to be linked with lasting memory and cognitive dysfunctions.[49]

(f) Tryptamines

There are a number of non-controlled tryptamines that are used for their psychedelic properties. They have effects similar to the tryptamines already controlled such as psilocybin (found in "magic mushrooms") or 3-[2-(dimethylamino)ethyl]indole (DMT). Tryptamines can be synthesized, although they also exist in plants, fungi and animals.[50] The work of Anne and Alexander Shulgin,[51] inter alia, provided illicit drug manufacturers with a knowledge base for the synthesis of a number of tryptamines. The use of tryptamines leads to a hallucinatory state, linked to auditory, visual and temporal distortions of reality. The intensity of the hallucinations is related to the concentration of the tryptamines in the visual cortex. The effects tend to vary strongly from person to person and depend on the setting of the "trip". In general, use will have an impact on the ability for abstract thought and impair the ability to make sensible judgements and understand common dangers, thus making users susceptible to accidents and injury. Their use can also cause temporary confusion, dissociative fugue (a psychiatric disorder characterized by a reversible amnesia relating to personal identity) and may trigger panic attacks ("bad trips"). Use

41 M. Bowden, "Non-traditional designer substances: a new category of psychoactives in New Zealand", April 2004. Available from www.erowid.org/chemicals/bzp/bzp_info1.shtml.

42 Imogen Thompson and others, "The benzylpiperazine (BZP)/trifluoromethylphenylpiperazine (TFMPP) and alcohol safety study: report for the Ministry of Health", 24 November 2006. Available from www.ndp.govt.nz/moh.nsf/indexcm/ndp-publications-bzp-tfmpp-alcohol-safety-study/$File/bzp-report-08.pdf.

43 C. Wilkins and others, *Legal Party Pill Use in New Zealand: Prevalence of Use, Availability, Health Harms and 'Gateway Effects' of Benzylpiperazine (BZP) and Trifluorophenylmethylpiperazine (TFMPP)* (Auckland, Massey University, 2006).

44 "Entactogens evoke mainly pleasant emotional effects of relaxation, feelings of happiness, increased empathy, and closeness to others" (see European Monitoring Centre for Drugs and Drug Addiction, "BZP and other piperazines").

45 United States, Department of Justice, Drug Enforcement Administration, "N-Benzylpiperazine (street names: BZP, A2, Legal E or Legal X)", Drug and Chemical Information, July 2012. Available from www.deadiversion.usdoj.gov/drug_chem_info/index.html; European Monitoring Centre for Drugs and Drug Addiction, *Report on the Risk Assessment of BZP in the Framework of the Council Decision on New Psychoactive Substances*, EMCDDA Risk Assessments, No. 8 (Luxembourg, Office for Official Publications of the European Communities, 2009); World Health Organization, "N-benzylpiperazine (BZP): pre-review report", prepared for the thirty-fifth meeting of the Expert Committee on Drug Dependence, Hammamet, Tunisia, 4-8 June 2012.

46 S. Elliott, "Current awareness of piperazines: pharmacology and toxicology", *Drug Testing and Analysis*, vol. 3, Nos. 7-8 (2011), pp. 430-438.

47 M. E. Tancer and C. E. Johanson, "The subjective effects of MDMA and *m*CPP in moderate MDMA users", *Drug and Alcohol Dependence*, vol. 65, No. 1 (2001), p. 97, cited in S. Elliott, "Current awareness of piperazines: pharmacology and toxicology", *Drug Testing and Analysis*, vol. 3, Nos. 7-8 (2011), pp. 430-438.

48 European Monitoring Centre for Drugs and Drug Addiction, *Report on the Risk Assessment of Ketamine in the Framework of the Joint Action on New Synthetic Drugs*.

49 T. Okon, "Ketamine: an introduction for the pain and palliative medicine physician", *Pain Physician*, vol. 10, No. 3 (2007), pp. 493-500.

50 M. Collins, "Some new psychoactive substances: precursor chemicals and synthesis-driven end-products", *Drug Testing and Analysis*, vol. 3, Nos. 7-8 (2011), pp. 404-416.

51 Shulgin and Shulgin, *TiHKAL (Tryptamines I Have Known and Loved): The Continuation*.

may be particularly problematic for persons already exhibiting symptoms of depression or schizophrenia. Internationally non-controlled tryptamines include 5-MeO-DMT ("alpha-O"), 5-MeO-DPT ("foxy-methoxy"), alpha-methyltryptamine (AMT), 4-AcO-DMT, 4-AcO-DiPT, and 5-HTP.[52]

(g) Plant-based new psychoactive substances

A number of plants are also classified as NPS according to the broad definition. Some of the most widely used psychoactive plants not under international control include kratom (*Mitragyna speciosa*), *Salvia divinorum* and khat (*Catha edulis*).[53]

a. Kratom

The cultivation and use of kratom is mostly linked to South-East Asia. Kratom has been used in traditional Thai medicine as an anti-diarrhoeal[54] and it has been investigated for the treatment for opioid dependence.[55] However, it is also widely used recreationally, leading to its prohibition in Thailand as well as in other countries, including Malaysia, Myanmar and Australia. Kratom is a stimulant at low doses and a sedative at high doses. At low doses, it tends to increase physical energy and alertness and increases the ability to do monotonous physical work. At higher doses, it helps to reduce physical and emotional pain and tends to generate a feeling of well-being before eventually developing its sedative properties, creating a mixed state of wakefulness and dreaming. Withdrawal symptoms for chronic users of kratom may include muscle aches, irritability, crying, runny nose, diarrhoea and muscle jerking.[56]

b. *Salvia divinorum*

Salvia divinorum is a psychoactive plant that can induce dissociative effects and is a potent producer of visual and other hallucinatory experiences. By mass, salvinorin A, the psychoactive substance in the plant, appears to be the most potent naturally occurring hallucinogen. Its native habitat is the cloud forests in Mexico. It has been consumed for hundreds of years by local Mazatec shamans, who use it to facilitate visionary states of consciousness during spiritual healing sessions.[57] It is also used in traditional medicine at lower doses as a diuretic to treat ailments including diarrhoea, anaemia, headaches and rheumatism. Effects include various psychedelic experiences, including past memories (e.g. revisiting places from childhood memory), merging with objects and overlapping realities (such as the perception of being in several locations at the same time).[58] In contrast to other drugs, its use often prompts dysphoria, i.e. feelings of sadness and depression, as well as fear. In addition, it may prompt a decreased heart rate, slurred speech, lack of coordination and possibly loss of consciousness.[59]

c. Khat

Khat is a flowering plant native to the Horn of Africa and the Arabian peninsula. Chewing fresh khat leaves has a history dating back hundreds of years among the communities in those areas. The psychoactive effects resulting from the chewing of khat can be linked to a number of alkaloids. The katin alkaloid was identified first in 1887, cathine in 1930[60] and cathinone in 1975.[61] The stimulant effects of khat leaves can be linked primarily to cathinone and, to a lesser extent, to cathine, both of which are controlled under the 1971 Convention. Khat also contains norephedrine,[62] which is used, inter alia, as precursor for the manufacture of amphetamine[63] and is thus controlled under the 1988 Convention.[64] A typical khat-chewing session results in the absorption of its active constituents, equivalent to the effects of some 5 mg of amphetamine use.[65] Given the limited amounts of these psychoactive substances contained in the khat leaf, in general, chewing khat induces only mild euphoria and excitement, as well as increased talkativeness. Withdrawal symptoms following occasional

52 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

53 United Nations Office on Drugs and Crime, *Global Smart Update 2012*, vol. 8, September 2012, pp. 4-5.

54 Karl L. R. Jansen and Colin J. Prast, "Ethnopharmacology of kratom and the *Mitragyna* alkaloids", *Journal of Ethnopharmacology,* vol. 23, No. 1 (1988), pp. 115-119.

55 H. Takayama and others, "Studies on the synthesis and opioid agonistic activities of mitragynine-related indole alkaloids: discovery of opioid agonists structurally different from other opioid ligands", *Journal of Medicinal Chemistry*, vol. 45, No. 9 (2002), pp. 1949-1956.

56 W. C. Prozialeck, J. K. Jivan and S. V. Andurkar, "Pharmacology of kratom: an emerging botanical agent with stimulant, analgesic, and opioid-like effects". *Journal of the American Osteopathic Association*, vol. 112, No. 12 (2012), pp. 792-799; J. E. Adkins, E. W. Boyer and C. R. McCurdy, "Mitragyna speciosa, a psychoactive tree from Southeast Asia with opioid activity", Current Topics in Medicinal Chemistry, vol. 11, No. 9 (2011), pp. 1165-1175.

57 L. J. Valdés and others, "Studies of *Salvia divinorum* (Lamiaceae), an hallucinogenic mint from the Sierra Mazateca in Oaxaca, Central Mexico", *Economic Botany*, vol. 41, No. 2 (1987), pp. 283-291.

58 D. M. Turner, *Salvinorin: The Psychedelic Essence of Salvia Divinorum* (San Francisco, Panther Press, 1996).

59 Carl Miller, "Negative effects of *Salvia divinorum*". Available from www.ehow.com/list_6726778_negative-effects-salvia-divinorum.html.

60 "Cathinone is the principal active constituent of khat responsible for the stimulant effects that have led khat to be known as a 'natural amphetamine'" (see J. P. Kelly, "Cathinone derivatives: a review of their chemistry, pharmacology and toxicology", *Drug Testing and Analysis,* vol. 3, Nos. 7-8 (2011), pp. 439-453).

61 Cathinone was discovered in khat and subsequently synthesized in 1974/1975 in the narcotics laboratory of United Nations (see Szendrei, "The chemistry of khat", pp. 5-35); United Nations, "Etudes sur la composition chimique du khat: recherches sur la fraction phénylalkylamine", document MNAR/5/76.

62 Szendrei, "The chemistry of khat".

63 *WHO Expert Committee on Drug Dependence: Thirty-fourth Report*, WHO Technical Report Series, No. 942 (Geneva, World Health Organization, 2006).

64 United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances of 1988 (United Nations, Treaty Series, vol. 1582, No. 27627).

65 I. Dhaifalah and J. Santavy, "Khat habit and its health effect: a natural amphetamine", *Biomedical Papers*, vol. 148, No. 1 (2004), pp. 11-15.

use tend to include mild depression and irritability or, following prolonged use, lethargy and slight tremors. The physical harm related to khat use is limited as compared with other drugs. Khat is not considered to be a "seriously addictive drug" according to the World Health Organization (WHO),[66] as "its potential for dependence is low".[67] However, the use of khat is not without problems. Khat affects sleep, leading to rebound effects such as late awakening, day-time sleepiness and poor work performance. Long-term use has a negative impact on health, causing problems such as tooth decay, gastrointestinal disorders such as constipation, inflammation of the stomach, ulcers and upper gastrointestinal tumours; and cardiovascular disorders, including irregular heartbeat and myocardial infarction.[68] Genetically predisposed people are vulnerable to developing psychoses. Serious socioeconomic consequences have also been reported in countries where khat use is widespread.[69]

C. THE RECENT EMERGENCE AND SPREAD OF NEW PSYCHOACTIVE SUBSTANCES

NPS have been reported in a number of countries in recent years. What is actually known today, however, may be just the very tip of the iceberg, as systematic studies on the spread of NPS do not exist. The limited information available suggests that their spread is far from negligible, and - once cannabis is excluded from the analysis - the spread of NPS comes close to, or even exceeds, the spread of several controlled drugs.

Spread at the global level

Number of countries reporting the emergence of new psychoactive substances

Pursuant to Commission on Narcotic Drugs resolution 55/1, entitled "Promoting international cooperation in responding to the challenges posed by new psychoactive substances", in 2012 UNODC sent a questionnaire on NPS to all Member States, to which 80 countries and territories replied. Most responses were received from countries in Europe (33), followed by countries and territories in Asia (23), in the Americas (12), in Africa (10) and in the Oceania region (2). In total 70 countries and territories,[70] i.e. 88 per cent of all responding countries, reported the emergence of NPS. Only 10 countries had not identified NPS in recent years.

The largest number of countries reporting NPS was in Europe (31 countries, or 44 per cent of all countries worldwide reporting the spread of NPS). This may have to do with the creation of an early warning system under the auspices of EMCDDA. Within Europe, the largest number of countries reporting on NPS was countries in Western and Central Europe (22 countries). Europe's largest country, the Russian Federation, also reported the emergence of NPS. The next largest number of countries was in Asia (19 countries, or 27 per cent), mostly in East and South-East Asia (11 countries), and in the Near and Middle East (7 countries). In total, 11 countries in the Americas (16 per cent) reported the emergence of NPS, including all of the countries of North America, six countries in South America and two in Central America. In Africa, seven countries (10 per cent) reported NPS, although only two countries could specify the category of the NPS.[71]

The largest proportion of countries reporting the emergence of NPS, as a percentage of all respondents, was in the Oceania region (100 per cent, based on reports from two countries), Europe (94 per cent), and the Americas (92 per cent), followed by countries in Asia (83 per cent) and Africa (70 per cent).

Groups of new psychoactive substances emerging between 2008 and 2012

Of the 70 countries reporting the emergence of NPS, 53 were in a position to provide information on the main groups of substances concerned. Most of those countries reported the emergence of ketamine and of plant-based substances, followed by piperazines, synthetic cannabinoids and phenethylamines.

The NPS markets are, however, extremely dynamic. Most of the ketamine, phenethylamines and piperazines emerged in Member States prior to 2008. In contrast, the large-scale entrance of new synthetic cannabinoids and synthetic cathinones was identified in later years. Thus, the type of NPS that emerges in the market changes depending on the period under investigation. Prior to 2008, ketamine dominated the market, followed by piperazines and the phenethylamines. In contrast, over the period 2008-2012, 66 per cent of the 53 reporting countries identified new

66 "Khat chewing in Yemen: turning over a new leaf", *Bulletin of the World Health Organization*, vol. 86, No. 10 (October 2008), pp. 741-742.

67 *WHO Expert Committee on Drug Dependence: Thirty-fourth Report.*

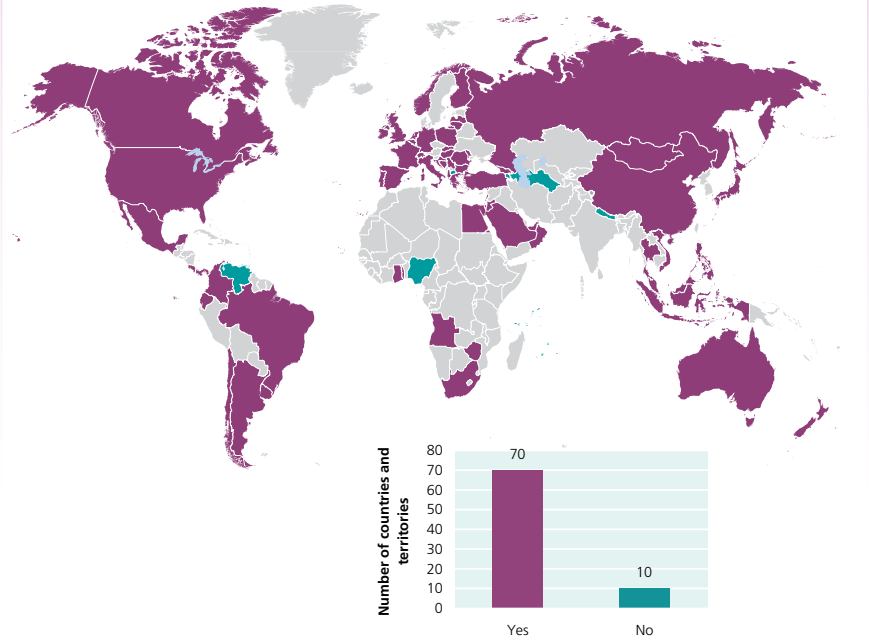
68 United States, National Institute on Drug Abuse, "DrugFacts: Khat", January 2011. Available from www.drugabuse.gov/publications/drugfacts/khat.

69 "Khat chewing in Yemen: turning over a new leaf", *Bulletin of the World Health Organization*, vol. 86, No. 10 (October 2008), pp. 741-742.

70 Albania, Andorra, Angola, Argentina, Australia, Bahrain, Belgium, Bosnia and Herzegovina, Brazil, Brunei Darussalam, Bulgaria, Canada, Cape Verde, Chile, China, Colombia, Costa Rica, Croatia, Ecuador, Egypt, Finland, France, Georgia, Germany, Ghana, Greece, Hong Kong, China, Hungary, Indonesia, Ireland, Israel, Italy, Japan, Jordan, Latvia, Lebanon, Liechtenstein, Lithuania, Luxembourg, Malaysia, Malta, Mexico, Mongolia, Netherlands, New Zealand, Norway, Oman, Panama, Philippines, Poland, Portugal, Republic of Moldova, Romania, Russian Federation, Saudi Arabia, Serbia, Singapore, Slovakia, South Africa, Spain, Switzerland, Thailand, Togo, Turkey, United Arab Emirates, United States of America, Uruguay, Viet Nam and Zimbabwe.

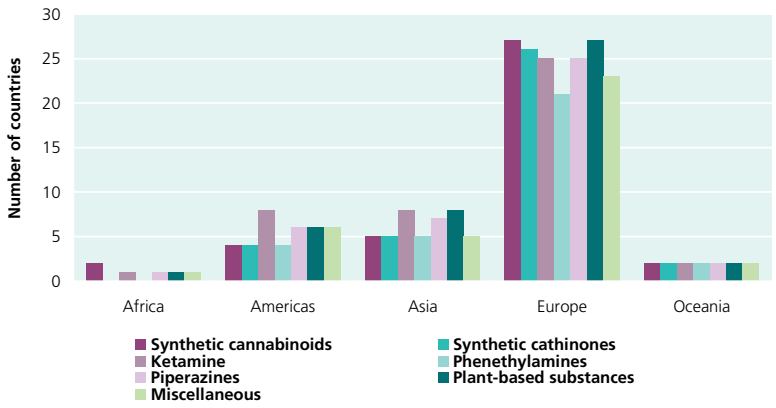
71 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

Map 1. **Global emergence of new psychoactive substances up to July 2012**



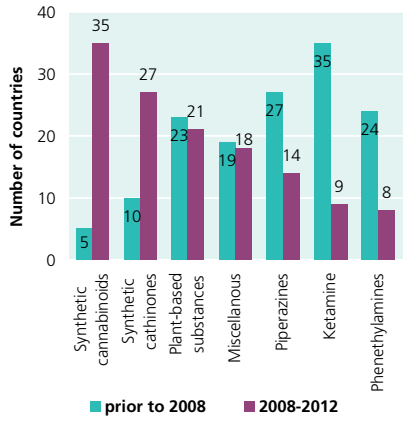
Source: United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

Fig. 1. **Regional emergence of new psychoactive substances, by group**



Source: United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

Fig. 2. **Global emergence of new psychoactive substances, by group, prior to 2008 and from 2008 to 2012**



Source: United Nations Office on Drugs and Crime, questionnaire on new psychoactive substances, 2012.

synthetic cannabinoids and 51 per cent identified new synthetic cathinones in their markets. This was followed by 40 per cent of the countries reporting non-controlled plant-based substances, 26 per cent piperazines, 17 per cent ketamine and 15 per cent phenethylamines in their markets. Comparing the periods prior to 2008 and from 2008 to 2012, the most striking increases are observed for the number of synthetic cannabinoids and synthetic cathinones entering the market.

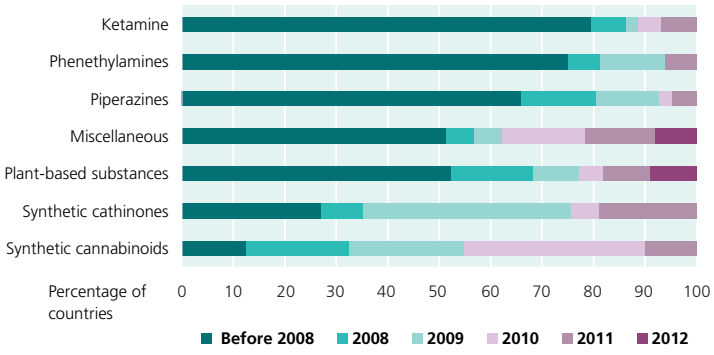
In 2009 most of the synthetic cathinones emerged, and they also constituted the majority of new substances appearing in the market. In 2010, it was new synthetic cannabinoids that were most frequently spotted. In 2011, once again, most new substances emerging were new synthetic cathinones.

Trafficking and seizure trends for new psychoactive substances

Though NPS by definition are not controlled at the international level, several are controlled at the national level and are being seized. Of the 70 countries and territories that reported NPS, 61 also reported seizures of such substances. Almost half of the countries seizing NPS were located in Europe (48 per cent), followed - at lower levels - by countries in Asia (23 per cent), Africa (19 per cent), the Americas (16 per cent) and the Oceania region (3 per cent).

Seizure trends, reflecting underlying trafficking activities, seem to largely confirm the patterns discussed so far. The overall trend for seizures of NPS between 2009 and 2012 - based on information from 42 countries - is clearly a rising one. This upward trend in seizures, in addition, reflects the increasing number of substances that have been scheduled in recent years in various countries. Seizures show increases for synthetic cannabinoids over the period 2009-2012 and, at least until 2011, also for the synthetic cathinones. In addition, the category "miscellaneous new psychoactive substances" showed continuing increases. In

Fig. 3. **Appearance of new psychoactive substance groups up to mid-2012**
Percentage of countries reporting the emergence of classes of new psychoactive substances from before 2008 to mid-2012



Source: United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

Table 1. Trend of new psychoactive substance seizures, 2009 to mid-2012[a]

New psychoactive substance group	2009	2010	2011	First half of 2012
Synthetic cannabinoids	↑	↑	↑	↑
Synthetic cathinones	↑	↑	↑	↔
Ketamine	↔	↔	↔	↔
Phenethylamines	↔	↑	↔	↔
Piperazines	↑	↔	↔	↓
Plant-based substances	↑	↑	↑	↔
Miscellaneous	–	↑	↑	↑

Source: United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

[a] Based on information from 42 countries. Respondents were asked to provide information on a yearly basis on observed seizure trends ("increasing", "stable", "decreasing") for the above-mentioned NPS groups. When the number of respondents reporting "increasing" trends exceeded the number of respondents reporting "declining" or "stable" trends, an overall increase is shown in the table. Similarly, when the number of reported "declining" trends exceeded the "increasing" or "stable" trends an overall decline is shown. Where the largest number of respondents reported "stable" trends, an overall stable trend is shown.

↑= Increasing, ↓= Decreasing, ↔ = Stable, – unknown.

contrast, no further increases were reported for ketamine. The overall trends for piperazines and phenethylamines appear to have been rather stable over the same period. Some differences can be observed for plant-based substances. Seizure trends for these drugs rose until 2011 and then started to stabilize.

Specific new psychoactive substances identified by national laboratories

Laboratories were asked to provide detailed information on the specific substances they examined. An analysis of the responses revealed that laboratories in 40 countries identified a total of 251 NPS to mid-2012. This exceeds the total number of currently controlled psychoactive substances at the international level (234).

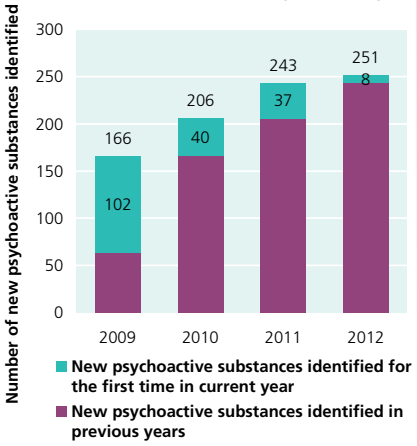
The number of newly identified NPS rose from 166 by 2009[72] to 251 NPS by mid-2012. Thus, the total number of identified NPS rose by more than 50 per cent at the global level between 2009 and mid-2012.

The bulk of the 251 NPS identified over the period 2009 to mid-2012 were synthetic cannabinoids (24 per cent of the total), phenethylamines (23 per cent) and synthetic cathinones (17 per cent), followed by tryptamines (10 per cent). These four groups accounted for almost three quarters (74 per cent) of all NPS identified and reported to UNODC.

The main substances in each category were identified on the basis of the number of times they were mentioned by Member States. The NPS most frequently reported (more than 50 times) by the laboratories of Member States over the period 2009 to mid-2012 period were:

- JWH-018 and JWH-073 among the synthetic cannabinoids
- Mephedrone, MDPV and methylone among the synthetic cathinones
- *m*CPP, BZP and TFMPP among the piperazines.

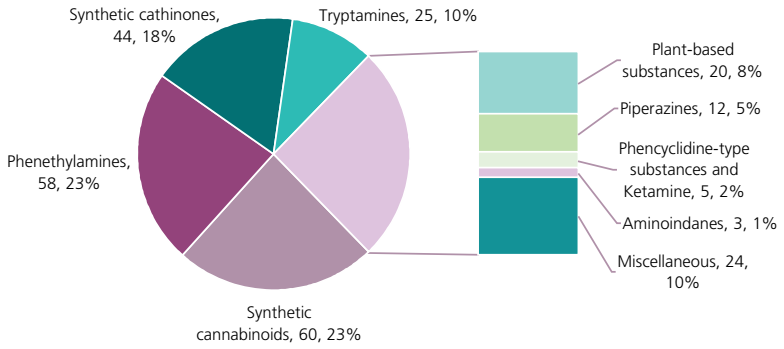
Fig. 4. Number of newly identified new psychoactive substances at the global level: 2009 to mid-2012 (cumulative)



Source: United Nations Office on Drugs and Crime questionnaire on new psychoactive substances, 2012.

72 This includes new psychoactive substances identified over the 2006-2008 period (53) and a few reports (11) from countries that could not identify precisely the year in which some specific new psychoactive substances emerged in their respective markets. A total of 102 new psychoactive substances were identified for the first time in 2009.

Fig. 5. **New psychoactive substances identified in national laboratories, 2009 to mid-2012** (number of substances and as a percentage of total (251) new psychoactive substances reported by 40 countries)[a]



Source: United Nations Office on Drugs and Crime, questionnaire on new psychoactive substances, 2012.
[a] Of the 40 countries responding, not all countries reported for every year.

Table 2. **Number of countries citing a region as the "primary source" for new psychoactive substances[a]**

	Cited as primary source region					
Reporting countries in:	*Asia*	*Europe*	*Americas*	*Africa*	*Oceania*	*Total*
Europe	11	8	0	0	0	19
Asia	5	0	0	0	0	5
Americas	1	0	2	1	0	4
Africa	0	1	1	0	0	2
Oceania	1	0	0	0	1	2
Total	18	9	3	1	1	32
Primary source (percentage of total)	56	28	9	3	3	100

Source: United Nations Office on Drugs and Crime, questionnaire on new psychoactive substances, 2012.
[a] Countries were asked to rank the source regions of the new psychoactive substances "reported or seized" on their territory; the replies were not scientifically validated by the United Nations Office on Drugs and Crime.

Origin and manufacture of new psychoactive substances

Europe was the region providing most of the information on the geographical origin of new psychoactive substances, which seem to originate primarily in Asia, notably in countries of East and South Asia that have advanced chemical and pharmaceutical industries.

A total of 32 countries reported information on the origin of new psychoactive substances (19 of them in Europe), and more than half of the countries cited Asia as the primary source for NPS (56 per cent) on their markets, followed by Europe (28 per cent) and the Americas (9 per cent).[73] All 5 reporting countries in Asia, as well as the single largest NPS markets in North America (United States), Europe (United Kingdom) and the Oceania region (Australia) also reported Asia as the primary source region. In line with information from Europol[74] and the International Narcotics Control Board,[75] China and India were most frequently named as source countries for NPS in Asia,

73 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances*. This is based on information from 32 countries. The sources are quoted here as reported by Member States. The results are thus biased towards Europe. They have not been scientifically validated as manufacturing/production sites by the United Nations Office on Drugs and Crime.

74 Most of the new psychoactive substances found on the European market are — according to information from border seizures and law enforcement investigations in the European Union member States — imported from China and, to a lesser degree from India. Most of the mephedrone production, according to the European Police Office (Europol), takes place in Asia, particularly in China. At the same time, Europol also highlights that some of the new psychoactive substances are sourced primarily from within Europe (e.g. *m*CPP) (see European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis*).

75 *Report of the International Narcotics Control Board for 2012.*

though a number of European countries were also mentioned, including the Czech Republic, Hungary, the Netherlands, Portugal, Spain, Ukraine and the United Kingdom.[76] Among the 19 reporting countries in Europe, 58 per cent saw Asia as their primary source region and 42 per cent Europe. Two of the three countries reporting from Latin America identified other countries in the Americas as their primary source. The Americas were mentioned by one African country as its main source. Another African country identified Europe as its main source.

Most of the countries providing information on the origin of NPS reported another country or region as the primary source, although they also reported some domestic production. Of the 50 countries that provided information on the source of NPS detected in their country, more than three quarters stated that there was no NPS production on their territory; only 12 countries (24 per cent) reported that there was some domestic production, mainly serving the local market. Domestic manufacture was reported by a number of countries in Europe, in the Americas and in Asia. EMCDDA reported the dismantling of NPS production-related facilities in the Netherlands as well as in Belgium, Ireland and Poland.[77] Nonetheless, the overall pattern remains one of limited domestic production and reliance on overseas imports. This is different from the clandestine manufacture of controlled psychotropic substances such as amphetamine-type stimulants, which typically occurs within the same region where the consumers are located.

The role of the Internet

The Internet seems to play an important role in the NPS business, more than it does in the illicit drug business in general: 88 per cent of the countries responding to a UNODC survey with a domestic NPS market indicated that the Internet was a key source for NPS detected in their country (35 out of 40 countries replying to this question). Most of the actual transport is then conducted by air and by mail.

The growing role of the Internet as a source for new psychoactive substances has been confirmed in the targeted EMCDDA Internet study ("snapshot"). The number of online shops offering to supply customers in European Union countries with NPS increased from 170 in January 2010 to 314 in January 2011 and 693 in January 2012.[78]

Nonetheless, this key role of the Internet perceived by authorities worldwide was not confirmed by a Eurobarometer survey conducted across the 27 European Union countries among 15- to 24-year-olds in 2011. Just 7 per cent (range: 0-27 per cent in the various European Union countries) of the young consumers of NPS purchased the substances over the Internet, i.e. far less than the 33 per cent who bought it in a specialized shop, the 36 per cent who acquired it at a party or in a club, or the 54 per cent who were offered the substances by a friend.[79] This indicates that while the import and wholesale business in NPS may be increasingly conducted via the Internet, more traditional distribution channels are still used for the retail trade.

Interest in new psychoactive substances as reflected in Internet searches

Data on the number of NPS abusers and on the size of the NPS market are very scarce. One indicator that can help in assessing the magnitude of the problem is the number of times a certain substance is searched for on the Internet. In the absence of global household surveys covering these substances, Internet searches are one of the few proxy variables that reflect interest in NPS, and thus, indirectly, their spread.

One can assume that there is a positive correlation between interest, and thus the searches for a substance, and the actual spread of a substance. Consumers generally wish to obtain information on the substances they are using or intend to use. Parents, teachers, the media and law enforcement agencies often try to obtain information on specific substances once a problem is encountered in their communities.

There are, of course, also some biases. Consumers of NPS may use the Internet to purchase such substances, a possibility that is more limited for controlled substances. Moreover, Internet availability plays a role. Thus, global Internet searches are biased towards developed countries. Even so, the main findings can provide an overall idea of reality.

When the findings are restricted to "substance abuse", the most widely searched NPS globally over the period 2008-2012 was Spice, followed by ketamine, *Salvia divinorum* and kratom. Cannabis, however, still leads the way, ahead of amphetamine-type stimulants, cocaine and heroin.

Data suggest that the interest in NPS over the period 2008-2012 (excluding Spice) was concentrated mainly on "bath salts" (such as mephedrone, and less so on MDPV), followed by ketamine, khat, *Salvia divinorum*, kratom, PMMA, JWH-018 and BZP. Most of the other substances do not figure prominently on this list. While interest in amphetamine-type stimulants declined (linked to "ecstasy"), searches for "bath salts" increased — particularly in 2012 — following some serious incidents and subsequent discussions about controlling such substances. Internet searches for "bath salts" started to approach those for "ecstasy" in 2012.

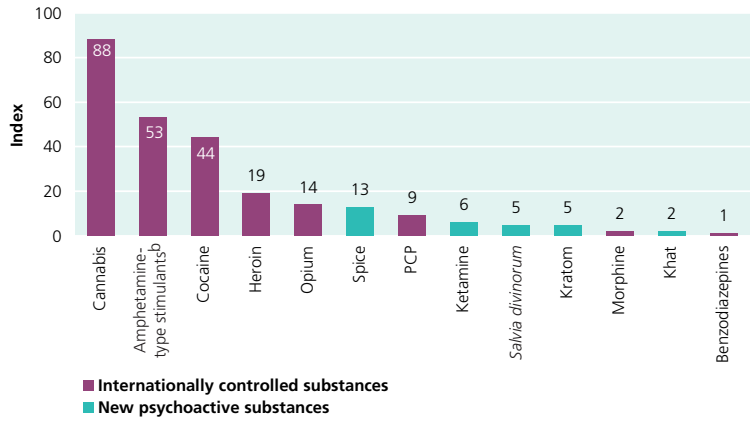
76 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

77 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe* (Luxembourg, Publications Office of the European Union, 2012).

78 Ibid.

79 Gallup Organization, *Youth Attitudes on Drugs: Analytical Report,* Flash Eurobarometer series No. 330 (European Commission, July 2011).

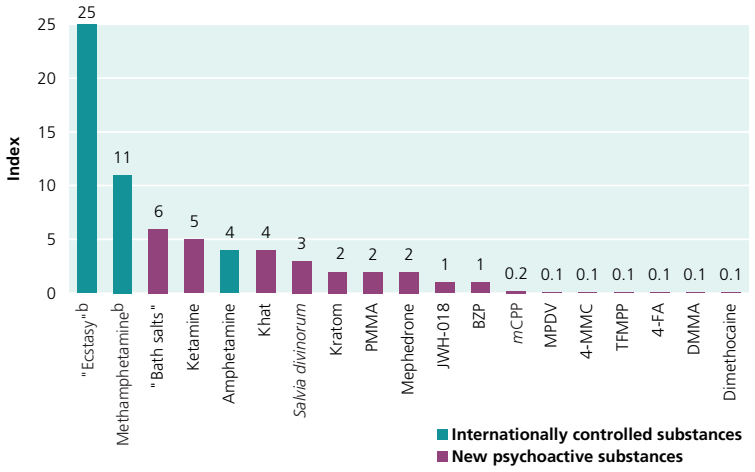
Fig. 6. **Index: Google searches made worldwide by Internet users for selected psychoactive substances, 2008-2012**[a]



Source: Google Trends, January 2008-December 2012.

[a] The numbers in the figure reflect how many searches have been done for a particular term as compared to other terms over the period 2008-2012 within the category of "substance abuse" (in order to avoid unintended search results for Spice). The data have been normalized and are presented on a scale from 0 to 100. The number 100 represents the peak search volume for any of the substances mentioned over the period. In this case, 100 represents the peak search volume for cannabis in November 2012. An overall average for each term, based on weekly data, has been calculated for the period 2008-2012 and is shown in the figure.
[b] Amphetamine-type stimulants: "ecstasy" including the search term "MDMA", "amphetamine", "methamphetamine", "jaba" and "shabu".

Fig. 7. **Index: Google searches made worldwide by Internet users for amphetamine-type stimulants and new psychoactive substances (excluding Spice), 2008-2012**[a]



Source: Google Trends, January 2008-December 2012.

[a] The number 100 represents the peak search volume for any of the substances mentioned over the period from 1 January 2008 to 31 December 2012. In this case, 100 represents the peak search volume for "bath salts" over the week of 27 May to 2 June 2012. (No filter was used for this search.)
[b] "Ecstasy" including the search term "MDMA"; methamphetamine, including the search terms "jaba" and "shabu".

Among Internet searches for the chemical groups of the main NPS, the strongest interest by far has been in synthetic cannabinoids, i.e. the main psychoactive substances contained in Spice. This has clearly increased over the period 2008-2012. Interest in piperazines started to emerge at the global level as of 2008 and peaked in 2009 before declining in subsequent years. Interest in phenethylamines remained relatively constant. Interest in tryptamines, in contrast, appears to have lost momentum in recent years. Interest in synthetic cathinones increased in 2010, and again in 2012, to the extent that it was higher than for the other NPS groups in that year, except the synthetic cannabinoids.

Spread of new psychoactive substances at the regional level

Europe

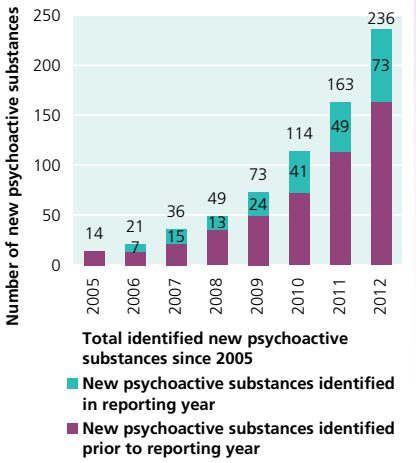
The most closely monitored region with regard to the emergence of NPS so far has been Europe, notably the European Union. EMCDDA, in cooperation with Europol, created the European early warning system for NPS. Whenever a NPS is detected in a country, information on its manufacture, trafficking and use is sent by the State to Europol and EMCDDA. The early warning system comprises the 27 European Union countries, as well as Norway and the two European Union candidate countries, Croatia and Turkey. Through the early warning system, a total of 236 substances were identified over the period 2005-2012, equivalent to more than 90 per cent of all substances found globally and reported to UNODC (251). The upward trend has clearly gained momentum in recent years.

The monitoring activities started in June 1997 with a joint action covering information exchange, risk assessment and control of new synthetic drugs. This was subsequently replaced by European Union Council decision 2005/387 on information exchange, risk assessment and control of NPS.[80]

Over 30 new synthetic drugs were reported through the early warning system under the 1997 joint action. The drugs identified were largely non-controlled phenethylamines and tryptamines and, less commonly, synthetic cathinones and piperazines.[81]

In comparison, 236 new substances were formally reported through the early warning system over the period 2005-2012, signalling the growing importance of NPS in Europe. In 2012, 73 new substances were detected,[82] up from 49 in 2011, 41 in 2010, 24 in 2009[83] and, on average, 5 per year over the period 2000-2005.[84]

Fig. 8. Evolution of new psychoactive substances reported to the early warning system, 2005-2011



Source: European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis* (Luxembourg, Publications Office of the European Union, 2013).

In contrast to the dominance of phenethylamines and tryptamines identified following the joint action in 1997, the substances identified over the period 2010-2012 fell mainly into the categories of synthetic cannabinoids (64), followed by "other new psychoactive substances" (40), synthetic cathinones (28), phenethylamines (24), tryptamines (5) and piperazines (2).[85] In 2012, the largest numbers of new substances identified were, for the fourth year in a row, synthetic cannabinoids (30 new substances), followed by "other new psychoactive substances" (19).[86]

Comparing the number of NPS identified over the period 2005-2008 with those identified over the period 2009-2012, the largest increase was for synthetic cannabinoids and synthetic cathinones, followed by increases for "other new psychoactive substances" and phenethylamines. On the other hand, the number of newly identified tryptamines and piperazines declined.

80 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *Early-Warning System on New Psychoactive Substances: Operating Guidelines*, pp. 11-15.

81 Ibid.

82 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis.*

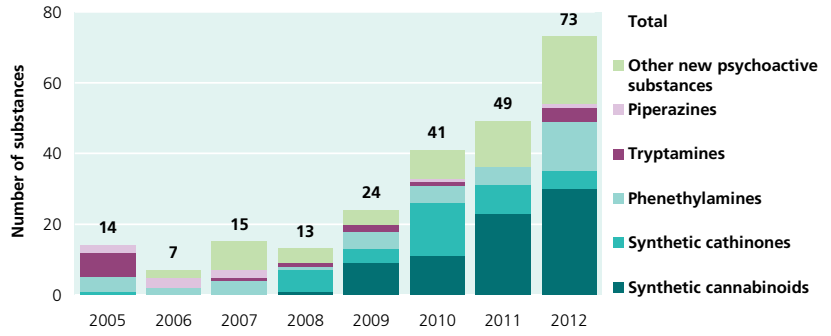
83 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe*, p. 89.

84 United Nations Office on Drugs and Crime, *Global Smart Update 2012*, vol. 8, September 2012.

85 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe*, p. 90.

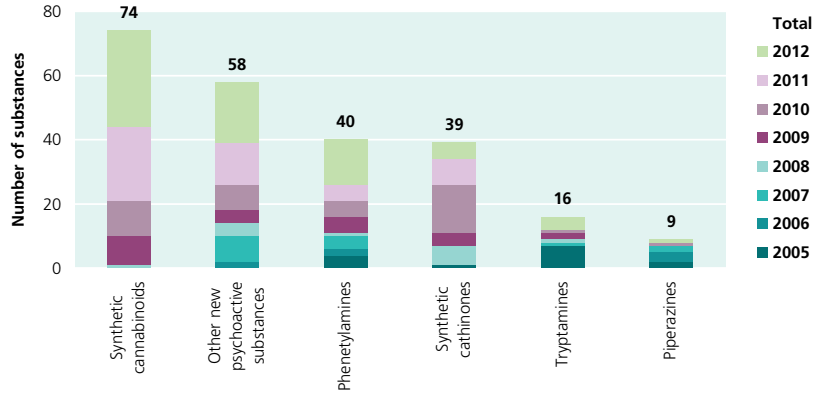
86 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, "EMCDDA-Europol 2011 annual report on the implementation of Council decision 2005/387/JHA", p. 9.

Fig. 9. **Number of new psychoactive substances newly reported annually through the European Monitoring Centre for Drugs and Drug Addiction's early warning system, 2005-2012**



Source: European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis* (Luxembourg, Publications Office of the European Union, 2013).

Fig. 10. **Main groups of new psychoactive substances identified through the European Monitoring Centre for Drugs and Drug Addiction's early warning system, 2005-2012**



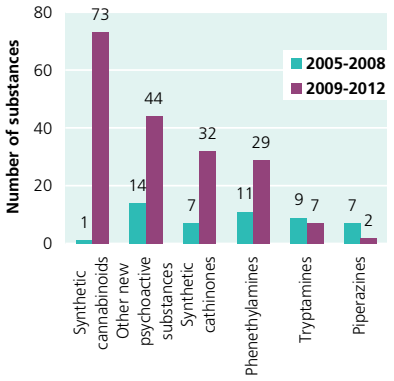
Source: United Nations Office on Drugs and Crime calculations based on European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis* (Luxembourg, Publications Office of the European Union, 2013).

A Eurobarometer survey of 12,000 randomly selected young people conducted across the European Union in 2011, revealed that on average, about 2.9 million people or 4.8 per cent of the population between 15 and 24 years of age, had experimented with legal substances that imitate the effects of illicit drugs. This is far from negligible, equivalent to about a fifth of the lifetime prevalence rate for cannabis in 2011 in the same age group. To put it in another perspective, that is about half the total number of people between the ages of 15 and 24 who had used illicit drugs other than cannabis in 2004.[87]

The definition of legal substances that imitate the effects of illicit drugs in the Eurobarometer survey refers to psychoactive substances that are not controlled at the national level. As more substances are controlled at the national than at the international level, legal substances that imitate the effects of illicit drugs include a slightly smaller number of substances than NPS. The overall prevalence of NPS in the European Union is thus possibly greater than indicated by the prevalence data on legal substances that imitate the effects of illicit drugs. On the other hand, many of the substances marketed as "legal highs" may be considered legal by consumers even though they are under national control, so that in practice, the reported prevalence of legal

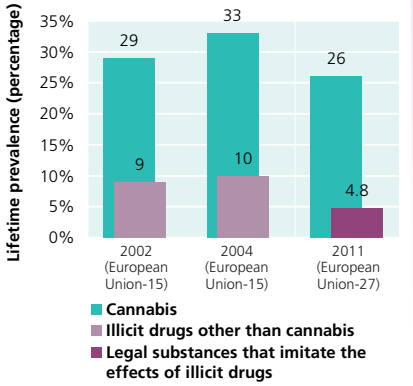
87 No data for 2011 are available.

Fig. 11. **Main groups of new psychoactive substances identified through the European Monitoring Centre for Drugs and Drug Addiction's early warning system, 2005-2008 compared to 2009-2012**



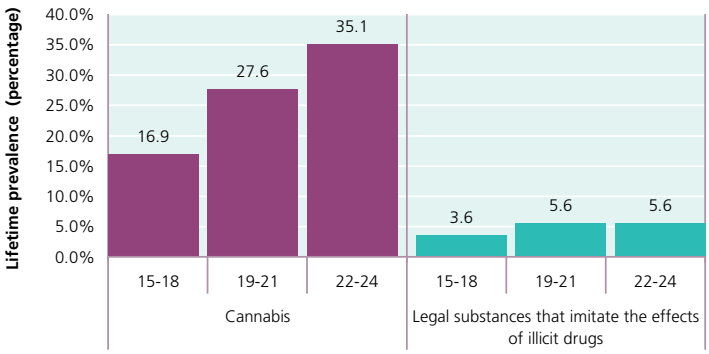
Source: United Nations Office on Drugs and Crime calculations based on European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis* (Luxembourg, Publications Office of the European Union, 2013).

Fig. 12. **Lifetime prevalence of the use of illicit drugs and of legal substances that imitate the effects of illicit drugs among 15 to 24 year old persons in the European Union, 2002-2011**



Source: United Nations Office on Drugs and Crime calculations based on European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *EU Drug Markets Report: A Strategic Analysis* (Luxembourg, Publications Office of the European Union, 2013).

Fig. 13. **Lifetime prevalence of the use of cannabis and of legal substances that imitate the effects of illicit drugs, among persons aged 15 to 24, by age group, in the European Union-27, 2011**



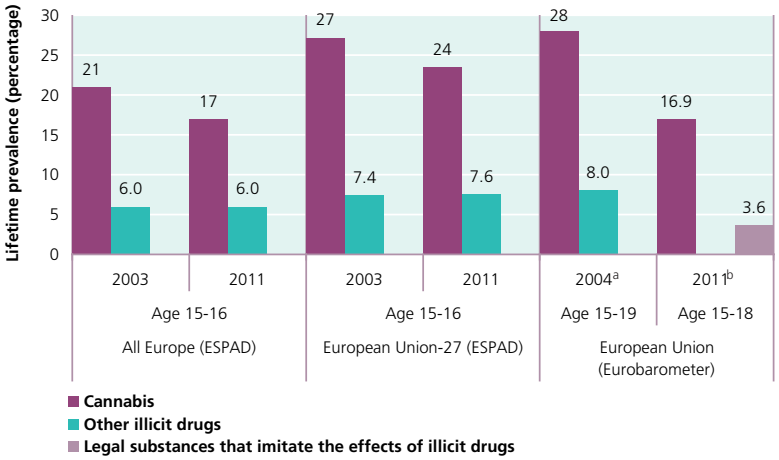
Source: Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*, Flash Eurobarometer series No. 330 (European Commission, July 2011).

substances that imitate the effects of illicit drugs may still be very close to the prevalence rates for NPS.

As expected, lifetime prevalence of legal substances that imitate the effects of illicit drugs rises with age, from 3.6 per cent among the European Union population aged 15 to 18 to 5.6 per cent among those aged 19 to 21 and 22 to 24. The increases in the lifetime prevalence with age are, however, less pronounced than for cannabis, probably reflecting the fact the legal substances that imitate the effects of illicit drugs have not been on the market for as long as cannabis.

Data from the Eurobarometer and the European School Survey Project on Alcohol and Other Drugs (ESPAD) surveys showed a statistically significant decline in cannabis

Fig. 14. Lifetime prevalence of the use of illicit drugs and legal substances that imitate the effects of illicit drugs among adolescents in the European Union,[a] 2003/04-2011



Source: Gallup Organization, Youth Attitudes on Drugs: Analytical Report, Flash Eurobarometer series No. 330 (European Commission, July 2011); and Taylor Nelson Sofres, Young People and Drugs, Flash Eurobarometer series No. 158 (European Commission, June 2004); B. Hibell and others, The 2011 ESPAD Report: Substance Use among Students in 36 European Countries (Stockholm, Swedish Council for Information on Alcohol and Other Drugs, 2012).

[a] There are issues related to comparability due to differences in the age groups analysed (ages 15-16 in the ESPAD survey, ages 15-18 in Eurobarometer survey), the target groups (adolescents attending school in the ESPAD survey, school and non-school attending youth in the Eurobarometer survey), the sample size (ESPAD study: 103,000 students across Europe; Eurobarometer study: 12,300 young people in 27 European Union member States including 4,600 people in the age group 15-18) and survey methodology (filling in questionnaires in school classes in the ESPAD survey; asked questions over the telephone in the Eurobarometer study. Nonetheless, the results — in broad terms — should provide some reasonable orders of magnitude.
[b] Data for 2004 refer to European Union-15; data for 2011 refer to European Union-27.

use and thus of drug use in general, among adolescents in Europe over the last decade.[88] The prevalence rates for illicit drugs other than cannabis remained largely stable between 2003 and 2011, according to ESPAD. In contrast, the use of legal substances that imitate the effects of illicit drugs appears to have increased. From negligible levels a decade ago, the lifetime prevalence rate of legal substances that imitate the effects of illicit drugs rose to 3.6 per cent among adolescents aged 15 to 18 in 2011. In some countries (Ireland and Poland), the use of legal substances that imitate the effects of illicit drugs among young people is even greater than the use of other drugs, and in a number of countries, including Latvia, Lithuania, Slovenia, Sweden and the United Kingdom, the levels are approaching those of other drugs, apart from cannabis.[89]

The lifetime prevalence rates for legal substances that imitate the effects of illicit drugs in the European Union appear to be slightly lower than the rates for amphetamines shown by the European School Survey Project on Alcohol and Other Drugs if adjusted to the age group 15 to 18, of a magnitude similar to the rate for "ecstasy" and larger than the corresponding rates for cocaine, LSD or heroin in Europe.[90]

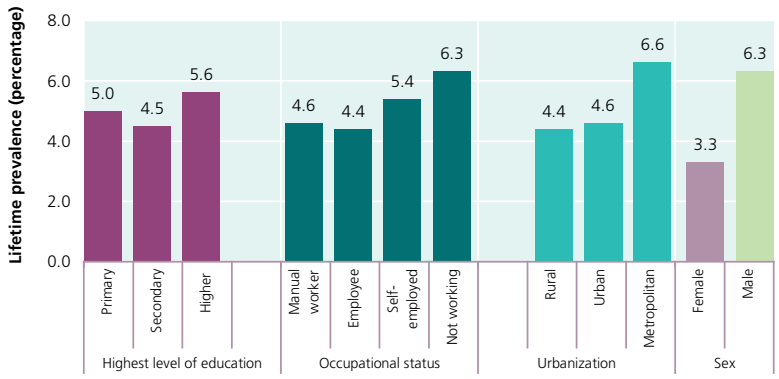
As in the case of other drugs, the use of legal substances that imitate the effects of illicit drugs is more widespread among males than among females, more common in metropolitan than in rural areas and more widespread among the unemployed population than among those working. Their use is slightly higher than average among those who have only completed primary education and lower than average among those having completed secondary education, and it rises again among those who have a higher

88 B. Hibell and others, *The 2011 ESPAD Report: Substance Use among Students in 36 European Countries* (Stockholm, Swedish Council for Information on Alcohol and Other Drugs, 2012).

89 "Approaching" has been defined here as a difference of less than 1 percentage point in the lifetime prevalence rates between the use of "illicit drugs other than cannabis" (2011 ESPAD study) and the use of "legal substances that imitate the effects of illicit drugs" (2011 Eurobarometer study).

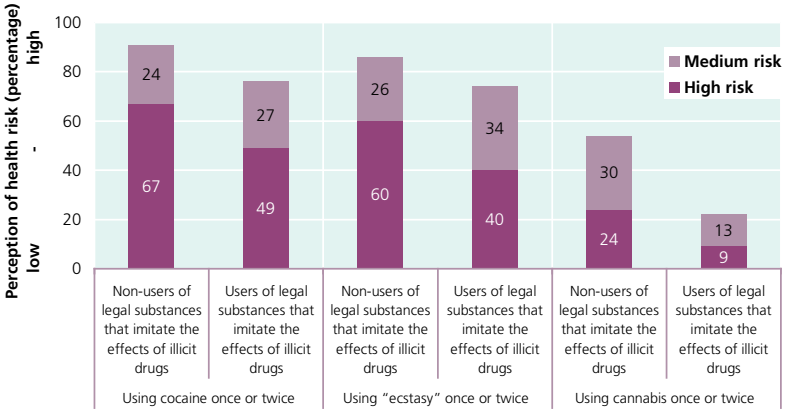
90 Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*; B. Hibell and others, *The 2011 ESPAD Report: Substance Use among Students in 36 European Countries* (Stockholm, Swedish Council for Information on Alcohol and Other Drugs, 2012); B. Hibell and others, *The ESPAD Report 2003: Alcohol and Other Drug Use Among Students in 35 European Countries* (Stockholm, Swedish Council for Information on Alcohol and Other Drugs and Pompidou Group of the Council of Europe, 2004); and Council of Europe, *Alcohol and Drug Use Among European 16-18 Year Old Students – Data from the ESPAD Project*, February 2007.

Fig. 15. **Use of legal substances that imitate the effects of illicit drugs among young people (aged 15-24) in the European Union-27, 2011,** by sociodemographic characteristics



Source: Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*, Flash Eurobarometer series No. 330 (European Commission, July 2011).

Fig. 16. **Perceived health risks of the use of controlled drugs by users and non-users of legal substances that imitate the effects of illicit drugs in the European Union, 2011**



Source: Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*, Flash Eurobarometer series No. 330 (European Commission, July 2011).

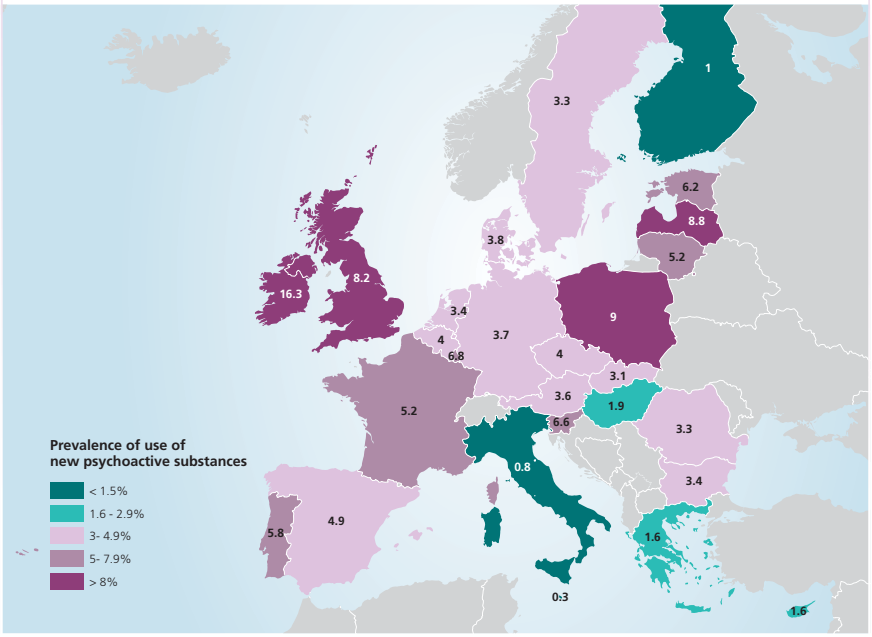
form of education (though a higher lifetime prevalence of persons with a higher level of education is also a reflection of the fact that they are older). This represents a U-curve (or inverted J-curve)[91] phenomenon, which is common in many drug markets around the world with regard to income and education.

Most of the users of legal substances that imitate the effects of illicit drugs (a) were offered such substances by a friend (54 per cent), (b) were offered them at a party or in a club (36 per cent), (c) bought them in specialized shops (33 per cent) or (d) bought them over the Internet (7 per cent).

Large proportions of such substances were sourced from "head shops" or "smart shops" in Italy (60 per cent), the Netherlands (60 per cent) and Ireland (57 per cent). The Internet played a clearly higher than average role as a source in Sweden (27 per cent), Germany (18 per cent), Denmark (14 per cent), Estonia (14 per cent), Finland (11 per cent), the Czech Republic (11 per cent) and Latvia (9 per cent).

91 *World Drug Report 2012*, p. 89.

Map 2. **Experience with legal substances that imitate the effects of illicit drugs in the European Union among persons aged 15-24, 2011**



Source: Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*, Flash Eurobarometer series No. 330 (European Commission, July 2011).

Users of legal substances that imitate the effects of illicit drugs showed lower risk perceptions with regard to the negative health effects of illicit drugs than the general population. As risk perceptions often go hand in hand with actual use, users of legal substances that imitate the effects of illicit drugs appear to be more vulnerable to experimentation with other drugs, including cocaine, "ecstasy" and cannabis.

Use of legal substances that imitate the effects of illicit drugs and use of cannabis often go hand in hand. In fact, 85 per cent of the users of legal substances that imitate the effects of illicit drugs in the European Union also consumed cannabis, compared to a rate of 23 per cent among non-users of legal substances that imitate the effects of illicit drugs (aged 15-24). Similarly, 31 per cent of lifetime cannabis users in the (unweighted) sample[92] experimented with legal substances that imitate the effects of illicit drugs, while the proportion was negligible among non-users of cannabis (0.8 per cent).[93]

The lifetime prevalence rates for the use of legal substances that imitate the effects of illicit drugs in individual European Union countries ranged from 0.3 per cent in Malta to more than 16 per cent in Ireland. Levels above the European Union average (4.8 per cent) have been reported — in descending order — from Ireland, Poland, Latvia and the United Kingdom, followed by Luxembourg, Slovenia, Estonia, Portugal, Lithuania, France and Spain.

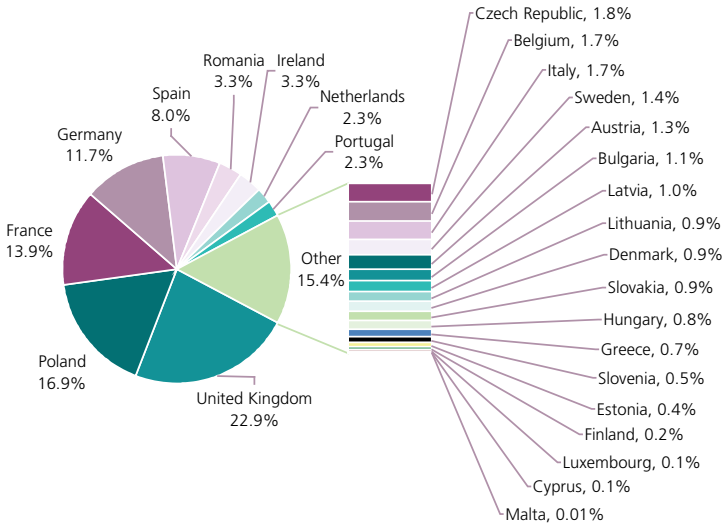
Country results, however, must be treated with caution, as the individual country samples were rather small (about 500 people in the Eurobarometer survey). Moreover, the authors explicitly cautioned that "the perception of substances included in the category 'new psychoactive substances' may have varied across countries".[94]

92 The sample consisted of about 500 persons in the larger countries and 250 in the smaller countries, totalling some 12,000 persons across the European Union. The calculations shown here were based on the unweighted sample of some 12,000 persons. Once the drug users are calculated based on the actual size of the population (aged 15-24) in each country, the proportion of users of legal substances that imitate the effects of illicit drugs among cannabis users falls from 30 per cent to less than 20 per cent.

93 UNODC calculations based on Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*.

94 Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*, p. 4.

Fig. 17. Distribution of users of legal substances that imitate the effects of illicit drugs across European Union countries (total: 2.9 million lifetime users in the age group 15-24, based on a sample of 12,313 persons interviewed across the European Union in May 2011)



Source: UNODC calculations based on Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*, Flash Eurobarometer series No. 330 (European Commission, July 2011) and United Nations population data.

The total number of lifetime users of legal substances that imitate the effects of illicit drugs among the population aged 15 to 24 in the European Union — as measured by Eurobarometer prevalence and United Nations population data — amounted to 2.9 million in 2011. The largest market for legal substances that imitate the effects of illicit drugs in the European Union is the United Kingdom (670,000 people experimenting with legal substances that imitate the effects of illicit drugs in the age group 15 to 24, or 23 per cent of the European Union total), followed by Poland (490,000 persons, or 17 per cent), France (400,000, or 14 per cent), Germany (340,000, or 12 per cent) and Spain (230,000, or 8 per cent). Those five countries accounted for almost three quarters (73 per cent) of all those experimenting with legal substances that imitate the effects of illicit drugs in the European Union.

Available data suggest that not only does the overall use of NPS differ significantly from country to country, so also do the specific substances. Depending on the country concerned, they are either synthetic cannabinoids, mephedrone or even ketamine.

Ireland: use of new psychoactive substances linked to several substances

The highest prevalence rate in Europe for legal substances that imitate the effects of illicit drugs was identified for Ireland (with a lifetime prevalence of 16.3 among those aged 15-24 in 2011).[95] The most widespread NPS in Ireland include Spice, various cathinone derivatives, piperazines, various products sold as legal alternatives for "ecstasy", LSA (products sold as legal alternatives to LSD) and kratom, sold as a legal alternative to opiates.[96]

A study among young persons aged 15 to 18 found a lifetime prevalence of "legal party pills" of 6.8 per cent among school attendees in 2008, which was the second highest after cannabis. The rate rises dramatically to 23.4 per cent[97] among school dropouts.

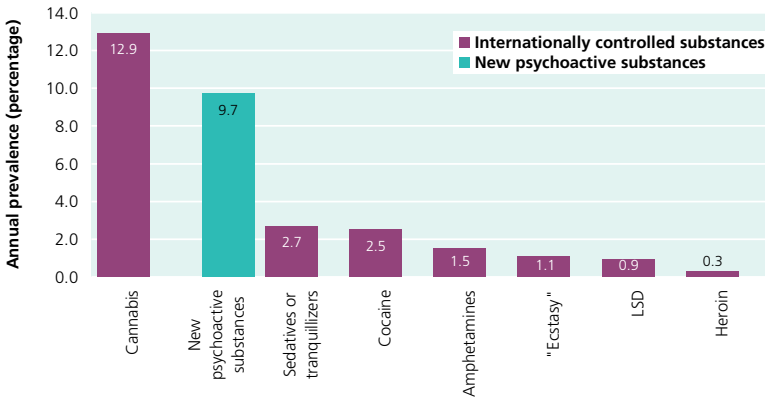
A subsequent general population survey in 2010/11 identified an annual prevalence of 9.7 per cent among the population aged 15 to 24, which was again far higher than the use of most drugs other than cannabis. The annual prevalence of use of NPS was almost four times as high as the prevalence rate for cocaine, more than six times the

95 Gallup Organization, *Youth Attitudes on Drugs: Analytical Report.*

96 "Legal highs and head shops: some basic facts". Available from www.drugs.ie/resourcesfiles/guides/Legal_highs_%26_headshops_leaflet.pdf.

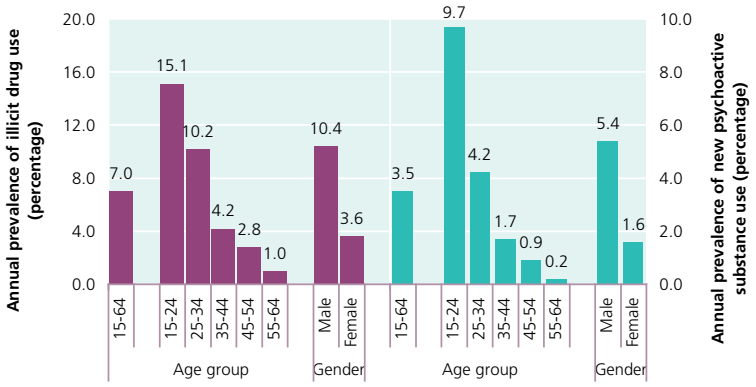
97 T. Haase and J. Pratschke, *Risk and Protection Factors for Substance Use Among Young People: A Comparative Study of Early School-Leavers and School Attending Students* (Dublin, National Advisory Committee on Drugs, 2010).

Fig. 18. **Ireland: annual prevalence of the use of new psychoactive substances compared to internationally controlled substances among the population aged 15 to 24, 2010/11**



Source: National Advisory Committee on Drugs and Public Health Information and Research Branch, "Drug use in Ireland and Northern Ireland: first result from the 2010/11 drug prevalence survey", Bulletin 1, November 2011.

Fig. 19. **Ireland: sociodemographic characteristics of the use of new psychoactive substances compared to illicit drugs, 2010/11**



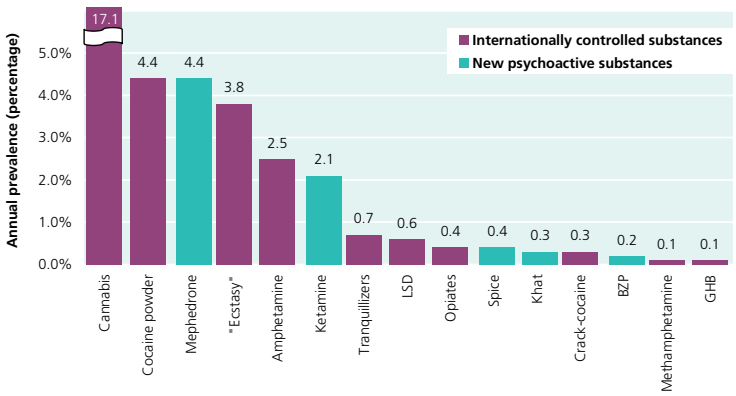
Source: National Advisory Committee on Drugs and Public Health Information and Research Branch, "Drug use in Ireland and Northern Ireland: first result from the 2010/11 drug prevalence survey", Bulletin 1, November 2011.

rate for amphetamines and almost nine times the rate for "ecstasy" use in Ireland in this age group. The differences become less pronounced once older age groups are considered.

The survey also showed that the annual prevalence of use of NPS declines with age and is more common among males than females. The decline with age is far more pronounced than for illicit drugs in general, reflecting the fact that the use of NPS is still far more of a youth phenomenon than overall illicit drug use.

The annual prevalence of NPS use among the general population aged 15 to 64 was markedly higher in the Republic of Ireland (3.5 per cent) than in Northern Ireland (1.1 per cent for mephedrone; 1.0 per cent for "legal highs" among those aged 15-64) or in England and Wales (1.4 per cent for mephedrone, 0.2 per cent for Spice, 0.2 per cent for khat and 0.1 per cent for BZP among those aged 16-59 in 2010/11).

Fig. 20. Annual prevalence of new psychoactive substances compared to other drugs in England and Wales among persons aged 16 to 24, 2010/11



Source: United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales*, 2nd ed. (London, July 2012).

The use of illicit drugs, including and excluding cannabis, declined in recent years in Ireland, both among students[98] and among the general population.[99] More recently, there are signs that the use of NPS may have stabilized or even declined, following changes in the legal framework as well as increased prevention activities and a (forced) reduction in the number of shops selling "legal highs". In fact, for 2011, the authorities reported an actual decline in admissions to accident and emergency services related to the abuse of "legal highs" for the first time in years.[100]

United Kingdom: use of new psychoactive substances linked primarily to mephedrone and ketamine

Europe's largest market for NPS is the United Kingdom, according to the Eurobarometer survey data. The United Kingdom had a lifetime prevalence rate of 8.2 per cent among those aged 15 to 24: this amounts to 23 per cent of all lifetime users of NPS in the European Union in 2011. The United Kingdom was also the country that identified the maximum number of NPS in the European Union (30 per cent of the total over the period 2005-2010).[101]

Fig. 21. Annual prevalence of the use of new psychoactive substances among the general population aged 16 to 59 in England and Wales, 2010/11 and 2011/12

Source: United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales*, 2nd ed. (London, July 2012).

For the fiscal year 2010/11, the British Crime Survey found that the most widespread NPS was mephedrone, with an annual prevalence rate of 1.4 per cent among the population aged 16 to 59 in England and Wales. This was followed by ketamine (0.6 per cent), khat (0.2 per cent), Spice (0.1 per cent) and BZP (0.1 per cent). Mephedrone turned

98 Council of Europe, *2011 ESPAD Report*, Stockholm 2012.

99 General population surveys confirm the downward trend in drug use. Annual prevalence of cannabis use fell from 6.3 to 6.0 per cent, cocaine from 1.7 to 1.5 per cent and "ecstasy" from 1.2 to 0.5 per cent for the population aged 15-64 over the period 2006/2007-2010/2011 (see National Advisory Committee on Drugs and Drug and Alcohol Information and Research Unit, cited in Health Research Board, *2011 National Report (2010 Data) to the EMCDDA by the Reitox National Focal Point: Ireland — New Developments, Trends and In-depth Information on Selected Issues* (Dublin, 2011).

100 United Nations Office on Drugs and Crime, data from the annual report questionnaire.

101 European Commission, "Commission Staff Working Paper on the assessment of the functioning of Council decision 2005/387/JHA on information exchange, risk assessment and control of new psychoactive substances", document SEC(2011) 912 (Brussels, 11 July 2011).

Table 3. Drugs reported as been used by drug users in the United Kingdom responding to the *MixMag-Guardian* Internet survey, 2011

Drugs very frequently reported
- Cannabis
- "Ecstasy"
- Cocaine
Drugs frequently reported, NPS indicated in "bold"
- **Ketamine**
- **Mephedrone**
- Valium
- Mushrooms
- Poppers
- Speed (amphetamine)
Drugs sometimes reported, NPS indicated in "bold"
- LSD
- 2C-B
- **Methotexamine**
- **2 C-I**
- DMT
- **Synthetic cannabis**
- Benzo-Fury
- **MDAI**
Drugs rarely reported, NPS indicated in "bold"
- Opium
- Ritalin
- **GBL**
- GHB
- **Methylone**
- Crack cocaine
- Heroin
- Methamphetamine

Source: "Mixmag's Drug Survey: the results", March 2012. Available from www.mixmag.net/drugssurvey.

out to be the third most abused substance after cocaine, on a par with "ecstasy". Among those aged 16 to 24, the use of mephedrone (4.4 per cent) was already on a par with that of cocaine powder, and thus the second most widely misused substance in 2010/11.

Data for England and Wales suggest that the prevalence of NPS started to fall in 2011/12, however, following years of increase. Mephedrone use declined following an import ban and its classification as a class B substance under the Misuse of Drugs Act in 2010. The annual prevalence fell by a fifth between 2010/11 and 2011/12, to 1.1 per cent among the general population aged 16 to 59, so that this substance now ranks fourth after cannabis (6.9 per cent), cocaine (2.2 per cent) and "ecstasy" (1.4 per cent) among the general population. Marginal declines were also observed in the use of ketamine and of Spice.[102]

This was confirmed by an Internet survey undertaken on behalf of the United Kingdom dance and clubbing magazine *MixMag* and the newspaper *The Guardian* in November and December 2011.[103] That survey showed a strong decline in mephedrone use between 2010 and 2011 among those who participated.[104] The same trend was observed for MDPV, another synthetic cathinone that was banned. The survey also provided some information on the use of a significant number of NPS that, so far have not been identified in national household surveys.

Poland: with new psychoactive substances linked to synthetic cannabinoids and synthetic cathinones

The second-largest market for NPS in Europe, after the United Kingdom, appears to have been Poland, with a lifetime prevalence rate of 9 per cent among those aged 15 to 24 (the second highest in Europe after Ireland), and with 17 per cent of the European Union's total number of lifetime users of such substances in this age group in 2011, according to the findings of the Eurobarometer survey.

Those findings have been reconfirmed in several national surveys undertaken in Poland in recent years. A question about the use of "*dopalacze*" ("legal highs") was introduced for the first time in a national survey conducted in 2009. The study revealed that 6 per cent of the general population aged 15 to 75 had experimented with such substances and 5 per cent had used them in the past year in 2009. The lifetime prevalence of the use of "legal highs" among the general population was even higher than the use of cannabis and all other drugs. Among those in the age group 15 to 24, every tenth person reported having experimented with "legal highs",[105] which is in line with the findings of the 2011 Eurobarometer study.

School surveys of students aged 18 and 19 found a large increase in the use of such "legal highs" between 2008 and 2010. Lifetime prevalence more than tripled, from 3.5 per cent in 2008 to 11.4 per cent in 2010, a much larger increase than for any other drug group over this period.[106]

As part of "sanitary inspection checks", more than 2,000 samples of substances were collected from shops selling "legal highs" in 2010. The most frequently encountered substances were synthetic cathinones (15 different compounds, of which MDPV — following the control of

102 United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales*, 2nd ed. (London, July 2012).

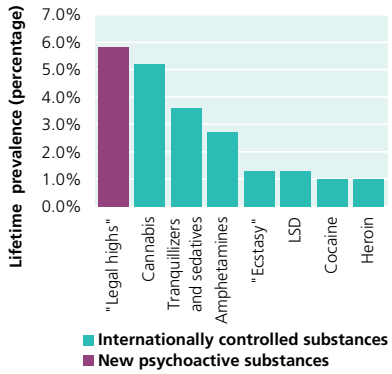
103 "Mixmag's Drug Survey: the results", March 2012. Available from www.mixmag.net/drugssurvey. The results of this (non-random) Internet survey were based on information from some 7,700 respondents from the United Kingdom with a mean age of 28 (see: Patrick Butler, "How the Guardian/Mixmag survey was constructed", The Guardian, 15 March 2012).

104 "Mixmag's Drug Survey: the results".

105 Artur Malczewski and others, *2010 National Report (2009 Data) to the EMCDDA by the Reitox National Focal Point: Poland — New Development, Trends and In-depth Information on Selected Issues* (Warsaw, National Bureau for Drug Prevention, 2010). Available from www.emcdda.europa.eu/attachements.cfm/att_142526_EN_PL-NR2010.pdf.

106 Artur Malczewski, "Psychoactive substance use among school adolescents: youth 2010" (Warsaw, National Bureau for Drug Prevention, 2011).

Fig. 22. Lifetime prevalence of the use of new psychoactive substances among the general population aged 15 to 75 in Poland,[a] as compared to other drugs, 2009



Source: Artur Malczewski and others, *2010 National Report (2009 Data) to the EMCDDA by the Reitox National Focal Point: Poland — New Development, Trends and In-depth Information on Selected Issues* (Warsaw, National Bureau for Drug Prevention, 2010).

[a] Sample size: 1,001.

mephedrone — was the most frequently found) and synthetic cannabinoids (16 different compounds). In sum, they accounted for some two thirds of all "legal highs" in Poland, followed by amines, piperazines, psychoactive plants and tryptamines.[107]

Other countries in Europe

Data for Latvia, the country with the third highest lifetime prevalence rate of use of NPS in the European Union, according to the 2011 Eurobarometer survey, show that synthetic cannabinoids are the drug of choice. The 2011 household survey data for Latvia found a lifetime prevalence of the use of synthetic cannabinoids of 2.6 per cent among the general population (aged 15-64), which made it the third most widely used substance after cannabis (12.4 per cent) and "ecstasy" (2.7 per cent) and higher than the rates for amphetamines (2.2 per cent), cocaine (1.5 per cent) or heroin (0.5 per cent).[108] The lifetime prevalence of synthetic cannabinoids among 15- and 16-year-old students in Latvia went as high as 10.6 per cent in 2011, making it the second most widely used substance after cannabis, more than twice as high as the prevalence of "ecstasy" (4.3 per cent), amphetamines (3.8 per cent), cocaine (3.5 per cent) or heroin (2.3 per cent). *Salvia divinorum* had a high lifetime prevalence rate of 4.4 per cent, slightly higher than the corresponding rates for "ecstasy" or amphetamines.[109]

Synthetic cannabinoids also appear to be the most widespread NPS in Germany, the fourth largest market for NPS in Europe, according to the 2011 Eurobarometer survey. An Internet survey conducted in 2011 among experienced drug users (average age: 24) identified synthetic cannabinoids as the most prevalent NPS, well exceeding the use of "research chemicals"[110] and "other legal highs".[111] Synthetic cannabinoids contained in Spice have also been linked to an increasing number of suicides in Germany.[112]

Ketamine appears to play a significant role in other countries. Spain, Europe's fifth largest market for NPS, according to the 2011 Eurobarometer survey, showed a lifetime prevalence of 1 per cent and an annual prevalence of 0.2 per cent for ketamine use among the population aged 15 to 64 in its 2011 national household survey. Lifetime prevalence among the age group 14 to 18 was 1.1 per cent, more than the rates for methamphetamine or heroin.[113] A study among 14- and 15-year-old students in 2010 suggested that, with a lifetime prevalence of 1.1 per cent, ketamine was as widespread as Spice, and almost three times as common as piperazines or mephedrone (0.4 per cent).[114]

Mephedrone plays a key role in some other countries. Data for Hungary reveal that 6 per cent of students aged 15 and 16 had experimented with mephedrone in 2011 (ESPAD). The lifetime prevalence of mephedrone use turned out to be the third highest, after cannabis and tranquillizers/sedatives, and was higher than the use of amphetamines (5.6 per cent), "ecstasy" (4.4 per cent), cocaine (2.5 per cent or heroin (1.6 per cent) in Hungary.[115]

The largest number of NPS identified in Europe over the first two quarters of 2012 was reported to UNODC by the Netherlands (48), surpassing the number of NPS iden-

107 Wioletta Żukiewicz-Sobczak and others, "Analysis of psychoactive and intoxicating substances in legal highs", *Annals of Agricultural and Environmental Medicine*, vol. 19, No. 2 (2012), pp. 309-314.

108 United Nations Office on Drugs and Crime, data from the annual report questionnaire.

109 2011 ESPAD study, cited in United Nations Office on Drugs and Crime, data from the annual report questionnaire.

110 "Research chemicals" in Germany are often understood to contain either synthetic cathinones (such as mephedrone) or phenethylamines or piperazines (see Drogen-Information-Berlin, "Der Trend zu Research Chemicals verstärkt sich". Available from www.drogen-info-berlin.de/htm/research-chemicals.htm).

111 B. Werse and C. Morgenstern, "Online survey on the topic of 'legal highs'", short report prepared for the Centre for Drug Research, Goethe University, Frankfurt, Germany, 2011.

112 E. Ludger and others, "Synthetic cannabinoids in 'spicelike' herbal blends: first appearance of JWH-307 and recurrence of JWH-018 on the German market", *Forensic Science International*, vol. 222, Nos. 1-3 (2012), pp. 216-222.

113 Spain, Delegación del Gobierno para el Plan Nacional sobre Drogas, *Encuesta sobre Alcohol y Drogas en Población General en España (EDADES) 2011-2012* (Madrid, 2013).

114 "ESTUDES" survey of drug use among secondary school students in Spain, cited in *2011 National Report (2010 Data) to the EMCDDA by the Reitox National Focal Point: Spain—New Developments, Trends and In-depth Information on Selected Issues* (Madrid, Delegación del Gobierno para el Plan Nacional sobre Drogas, 2011).

115 2011 ESPAD study, cited in United Nations Office on Drugs and Crime, data from the annual report questionnaire.

tified in the United Kingdom (38) during that period. Most of the NPS identified in the Netherlands were new phenethylamines (15), followed by synthetic cannabinoids (9) and synthetic cathinones (7).[116]

North America

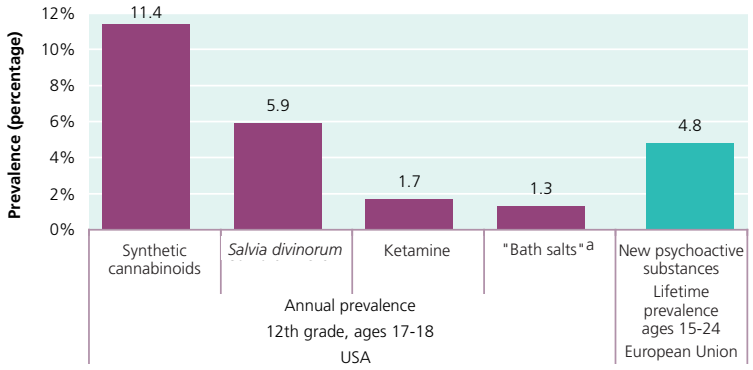
The market for NPS in North America is highly diversified. During the first six months of 2012, authorities in North America identified 82 NPS and reported them to UNODC.

At the same time, the overall use of NPS appears to be more widespread in North America than in Europe. In 2011, the lifetime prevalence rate for the use of new substances that imitate the effects of illegal drugs amounted to 4.8 per cent among those aged 15 to 24 in the European Union, while the Monitoring the Future survey in the United States identified an annual prevalence rate of 11.4 per cent among twelfth-grade students (typically aged 17 or 18) for synthetic cannabinoids alone.[117] In addition, *Salvia divinorum* (5.9 per cent) and, to a lesser extent, ketamine (1.7 per cent) and "bath salts" (1.3 per cent in 2012) are also consumed in the United States. Total use of NPS, ranging from 11.4 per cent (including only users of synthetic cannabinoids) to 20.3 per cent (assuming no polydrug use), was thus at least twice as high as in the European Union (4.8 per cent lifetime prevalence) and higher than in all European Union countries, except perhaps Ireland (16.3 per cent). Available data are based on lifetime prevalence for the European Union and annual prevalence for the United States. Expressing the results in a common metric (annual or lifetime prevalence) would probably result in an even more pronounced difference between the European Union and the United States.

United States of America

The United States identified 62 NPS that appeared on its market during the first six months of 2012, the largest number of NPS reported by any single country to UNODC for this period. The most frequently reported substances were synthetic cathinones (25), synthetic cannabinoids (19) and phenethylamines (8).[118] For 2012 as a whole, United States authorities, based on its National Forensic Laboratory Information System, identified 51 new synthetic cannabinoids and 31 new synthetic cathinones. In addition, 76 other compounds, including phenethylamines (mostly 2C compounds), tryptamines and piperazines, were identified. Thus, in total 158 NPS[119] were identified for the first time in the United States in 2012, more than twice as many as in the European Union (73).[120]

Fig. 23. Use of new psychoactive substances among youth in the United States (aged 17-18) and in the European Union (aged 15-24), 2011



Source: United States, National Institute on Drug Abuse, Monitoring the Future survey; and Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*, Flash Eurobarometer series No. 330 (European Commission, July 2011).

[a] Data for "bath salts" refer to 2012.

116 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

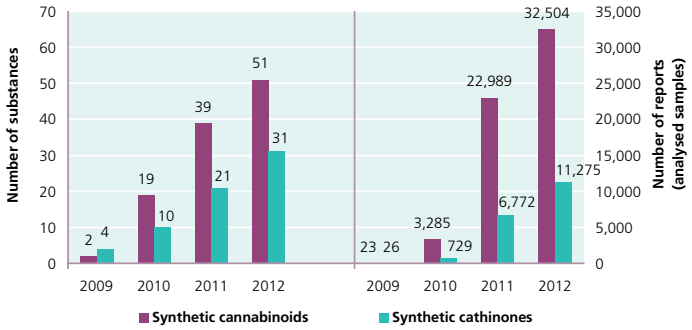
117 See United States, National Institute on Drug Abuse, *Monitoring the Future: National Survey Results on Drug Use, 1975-2011, vol. 1, Secondary School Students 2011* (Ann Arbor, Michigan, University of Michigan Institute for Social Research, 2011). Available from www.monitoringthefuture.org.

118 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

119 United States, Drug Enforcement Administration, National Forensic Laboratory Information System, cited in a presentation at the side event held during the fifty-sixth session of the Commission on Narcotic Drugs entitled "New psychoactive substances: regional approaches and challenges: United States — situation and response", 11 March 2013.

120 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, *European Union Drug Markets Report: A Strategic Analysis.*

Fig. 24. Number of synthetic cannabinoids and synthetic cathinones identified in the United States through the National Forensic Laboratory Information System and its reports, 2009-2012



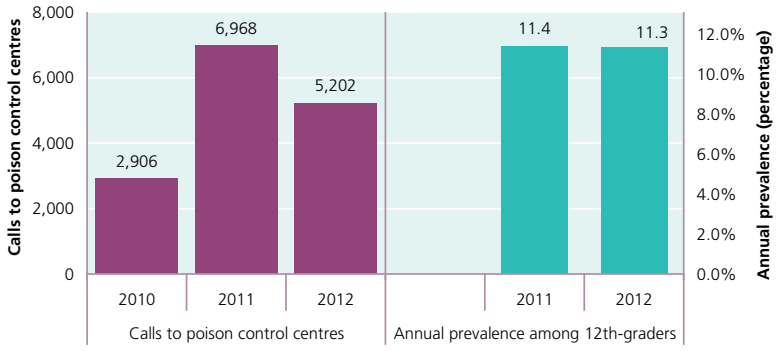
Source: United States, Drug Enforcement Administration, National Forensic Laboratory Information System, cited in a presentation at the side event held during the fifty-sixth session of the Commission on Narcotic Drugs entitled "New psychoactive substances: regional approaches and challenges: United States — situation and response", 11 March 2013.

The use of NPS among students in the United States is already more widespread than the use of all other illicit drugs except cannabis. This is primarily a result of the use of synthetic cannabinoids. The number of calls received by poison control centres for "synthetic marijuana" (i.e. synthetic cannabinoids) more than doubled, from approximately 2,900 in 2010 to almost 7,000 in 2011. However, the trend appears to have stabilized or declined since, following the "emergency scheduling" of these substances. Between 2011 and 2012, calls to poison control centres related to "synthetic marijuana" declined by approximately 25 per cent.

The annual prevalence of synthetic cannabinoids reached 11.4 per cent among twelfth-grade students in 2011 and then declined marginally to 11.3 per cent in 2012. Nonetheless, the level remains high. Other important NPS that have appeared on the market include *Salvia divinorum* (4.4 per cent) and ketamine (1.5 per cent). "Bath salts", containing various synthetic cathinones, were used by 1.3 per cent of students. Their use was already more widespread than that of crack cocaine, methamphetamine or heroin among twelfth-grade students.

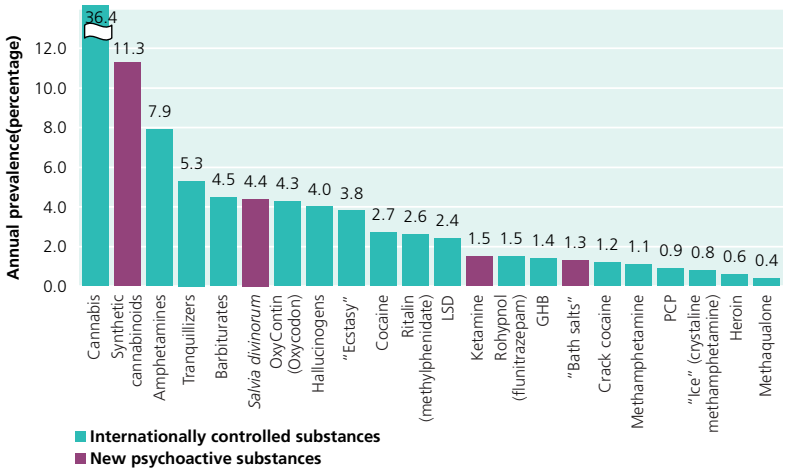
At the same time, data also show that use of several of the NPS among twelfth-grade students declined in 2012: marginally in the case of synthetic cannabinoids, by 12 per cent for ketamine and by as much as 25 per cent for *Salvia*

Fig. 25. Synthetic cannabinoids: calls to poison control centres, 2010-2012, and annual prevalence among twelfth-grade students, 2011-2012



Source: American Association of Poison Control Centers, "Synthetic marijuana data", updated 28 February 2013; and United States, National Institute on Drug Abuse, Monitoring the Future survey.

Fig. 26. Use of new psychoactive substances, as compared with other drugs, among twelfth-grade students in the United States, 2012



Source: United States, National Institute on Drug Abuse, Monitoring the Future survey.

divinorum. These declines did not go hand in hand with increased use of other drugs. In fact, most of the prevalence rates for the use of psychoactive substances declined marginally in 2012.

The 2012 Monitoring the Future study revealed that, among twelfth-grade students, the perceived risks linked to the consumption of synthetic cannabinoids were considered to be higher than those for experimenting with marijuana, though still lower than for experimenting with "ecstasy", cocaine or heroin.[121]

Similar to the patterns found for other drugs, use of synthetic cannabinoids continues to rise until the late teenage years, before declining. However, a few specific traits can be identified. While overall drug use is highest among twelfth-grade students (those aged 17-18), the prevalence rate for the use of synthetic cannabinoids is highest among those aged 19 and 20. Levels of synthetic cannabinoid use are still high for those aged 21 and 22, but fall rapidly among older age groups. This pattern is far more pronounced than for drug use in general. Thus, the use of synthetic cannabinoids is more concentrated among youth and young adults than is the use of drugs in general. The same is true for *Salvia divinorum* and ketamine.

The concentration of the use of synthetic cannabinoids among youth and young adults is also reflected in emergency-department visits. More than three fourths (76 per cent) of such visits in 2010 that were related to the abuse of synthetic cannabinoids involved patients aged 12 to 29, a far larger proportion than for other substances (e.g. 57 per cent for cannabis).[122]

There were more than 11,400 visits to emergency departments resulting from the abuse of synthetic cannabinoids in 2010, equivalent to a rate of 3.7 per 100,000 inhabitants. This was higher than the rates linked to LSD (1.3), GHB (0.6), ketamine (0.3) or flunitrazepam (0.2), similar to the rates for prescription stimulants (amphetamine/dextroamphetamine, 4.2), though lower than for "ecstasy" (7.0), methamphetamine (16.7), heroin (72.6) or cocaine (157.8).[123]

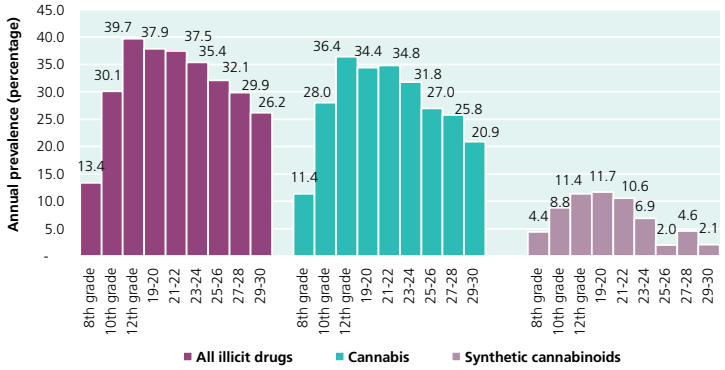
An analysis of sociodemographic characteristics reveals that males are more than twice as likely to use synthetic cannabinoids as females, a far higher ratio than for drugs in general. The same applies to *Salvia divinorum*. Emergency department visits also confirm this skewed sex ratio: 78 per cent of all such visits in 2010 that were related to synthetic cannabinoids among patients aged 12 to 29 were by

121 See www.monitoringthefuture.org/data/12data/pr12t8.pdf.

122 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, "The DAWN report: drug-related emergency department visits involving synthetic cannabinoids" (Rockville, Maryland, 4 December 2012).

123 United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, "Drug Abuse Warning Network: national estimates of drug-related emergency department visits, 2004-2010". Available from www.samhsa.gov/data/DAWN.aspx.

Fig. 27. Age distribution in the United States for the use of synthetic cannabinoids, as compared with other drugs, 2011



Source: United States, National Institute on Drug Abuse, Monitoring the Future survey, data tables and figures, 2012; and L. D. Johnston and others, *Monitoring the Future: National Survey Results on Drug Use, 1975-2011*, vol. II, *College Students and Adults Ages 19-50* (Ann Arbor, University of Michigan, Institute for Social Research, 2012).

males.[124] Overall drug-related visits to emergency departments are more gender-balanced, with males accounting for only 56 per cent of the total.[125]

In general, drug use correlates positively with the size of a community, i.e. low rates in small farming communities and high rates in metropolitan areas. This is the case for cannabis, cocaine and "ecstasy", as well as for drugs in general. However, the pattern is reversed when it comes to synthetic cannabinoids. The highest prevalence rates for the use of synthetic cannabinoids are found in small farming communities, while the lowest rates are encountered in large cities.

More detailed information is also available for ketamine. Its use declines with age after the late teens, is more prevalent among males than females and is most prevalent in the west and the north-east of the country, thus showing patterns similar to drug use in general. The Drug Enforcement Administration reported Mexico as a major source country. In addition, pharmaceutical companies operating in India were identified in several cases as the source for ketamine found on the United States market.[126]

Another major NPS in the United States in terms of negative health consequences is methylenedioxypyrovalerone (MDPV), a synthetic cathinone.[127] It was frequently sold as a "bath salt", at least until it (together with mephedrone, another "bath salt") became a nationally controlled substance in July 2012.[128] The Monitoring the Future survey revealed that 33.2 per cent of twelfth-grade students in 2012 perceived it as a "great risk" to experiment once or twice with such "bath salts". Trying "bath salts" was thus perceived to be a greater risk than experimenting with *Salvia divinorum* (13.8 per cent), "marijuana" (14.8 per cent) or synthetic cannabinoids (23.5 per cent), and almost as risky as experimenting with amphetamines (34.3 per cent). Nevertheless, the risks are still perceived to be lower than for the use of cocaine (51.6 per cent) or "ice" (crystal methamphetamine (67.8 per cent)), even though "bath salts", and notably MDPV, share several of the characteristics of cocaine and methamphetamine. According to research undertaken by the National Institute on Drug Abuse, MDPV is potentially more dangerous than cocaine. MDPV raises brain dopamine in a manner similar to cocaine, but is at least 10 times as potent.[129] The rewarding and reinforcing effects of MDPV in rats were shown to be nearly identical to those of methamphetamine.[130]

124 Substance Abuse and Mental Health Services Administration, "The DAWN report: drug-related emergency department visits involving synthetic cannabinoids".

125 Substance Abuse and Mental Health Services Administration, Drug Abuse Warning Network, national estimates of drug-related emergency department visits, 2004-2010.

126 United States, Department of Justice, Drug Enforcement Administration, "Ketamine (street names: Special K, 'K', Kit Kat, Cat Valium)", August 2011. Available from www.deadiversion.usdoj.gov/drug_chem_info/ketamine/ketamine.pdf.

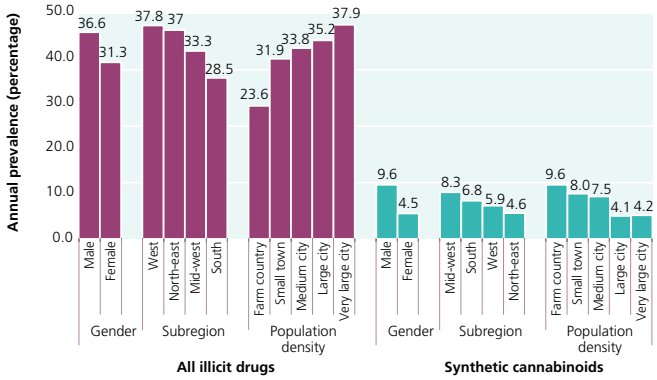
127 United States, National Institute on Drug Abuse, "DrugFacts: synthetic cathinones ('bath salts')", revised November 2012. Available from www.drugabuse.gov/publications/drugfacts/synthetic-cathinones-bath-salts.

128 The law enumerates 31 compounds that are explicitly banned; 20 from the list are "synthetic marijuana" varieties and 10 are "bath salts" (see Patience Haggin, "Obama signs federal ban on 'bath salt' drugs", *Time NewsFeed*, 10 July 2012).

129 National Institute on Drug Abuse, "DrugFacts: synthetic cathinones ('bath salts')".

130 Ibid.

Fig. 28. **Sociodemographic and geographic characteristics of the use of synthetic cannabinoids in the United States, as compared with other drugs, ages 19-30, 2011**



Source: L. D. Johnston and others, *Monitoring the Future: National Survey Results on Drug Use, 1975-2011*, vol. II, *College Students and Adults Ages 19-50* (Ann Arbor, University of Michigan, Institute for Social Research, 2012).

Canada

NPS are also widely encountered in Canada. The authorities there identified 59 NPS during the first six months of 2012, almost as many as in the United States. Most of the NPS were synthetic cathinones (18), synthetic cannabinoids (16) and phenethylamines (11).[131]

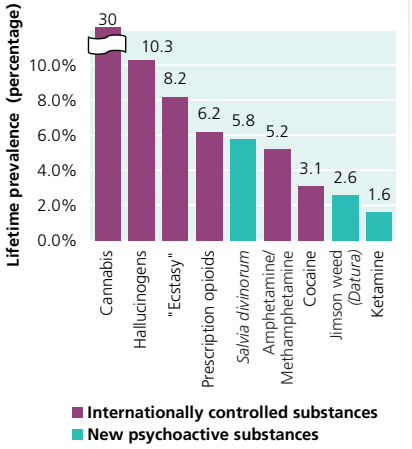
In a national school survey in 2011, widespread use of NPS among tenth-grade students (aged 15-16) was reported for *Salvia divinorum* (lifetime prevalence of 5.8 per cent), jimson weed or *Datura* (2.6 per cent), a hallucinogenic plant, and ketamine (1.6 per cent). Given the strong decline in ketamine use in the United States since the beginning of the millennium, its use among tenth-grade students in Canada is now slightly higher than in the United States (1.2 per cent in 2011).

The general household survey for 2011 lists only *Salvia divinorum* (lifetime prevalence of 1.6 per cent) among NPS. Its use is more widespread than that of methamphetamine (0.7 per cent) or opioids (0.6 per cent), though less common than that of amphetamine-type stimulants, cocaine or cannabis.[132]

Latin America and the Caribbean

NPS have also started to emerge in the countries of Latin America, even though, generally speaking, levels of misuse of such substances in the region are lower than in North America or Europe. Countries reporting the emergence of

Fig. 29. **Lifetime use of new psychoactive substances compared with other drugs among tenth-grade students (aged 15-16) in Canada, 2011**



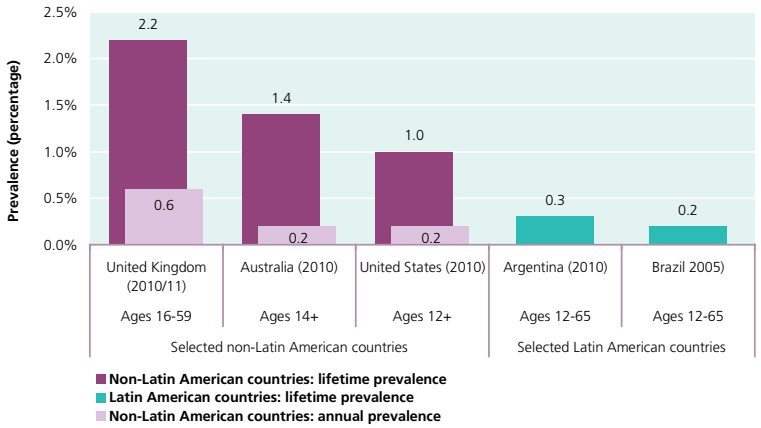
Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire.

NPS included Argentina, Brazil, Chile, Colombia, Costa Rica, Ecuador, Mexico, Panama and Uruguay. NPS reported included ketamine and plant-based substances, followed by piperazines, synthetic cathinones, phenethylamines and, to a lesser extent, synthetic cannabinoids. Brazil, for instance, reported the emergence of mephedrone and of DMMA (a phenethylamine) in its market; Chile

131 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances*.

132 United Nations Office on Drugs and Crime, data from the annual report questionnaire.

Fig. 30. Ketamine use among the general population, 2010 (or latest year available)



Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire; Home Office, *Drugs Misuse Declared: Findings from the 2011/12 Crime Survey for England and Wales*, 2nd ed. (July 2012); Australian Institute of Health and Welfare, 2010 National Drug Strategy Household Survey Report, Drug Statistics Series No. 25 (Canberra, July 2011); United States, Department of Health and Human Services, Substance Abuse and Mental Health Services Administration, 2010 National Survey on Drug Use and Health.

reported the emergence of *Salvia divinorum* and tryptamine; and Costa Rica reported the emergence of *N*-benzylpiperazine (BZP) and TFMPP, two piperazines.[133]

In addition, a number of other NPS have also started to appear on the market. For instance, the misuse of ketamine has been reported in household surveys, notably in the two largest countries of the Southern Cone. A national household survey conducted in Argentina in 2010 found a lifetime prevalence of ketamine use of 0.3 per cent among the population aged 12 to 65. This was, however, still lower than the lifetime prevalence rates for ketamine use reported from the United Kingdom (2.2 per cent), Australia (1.4 per cent) and the United States (1.0 per cent). Nonetheless, ketamine use in Argentina is not insignificant. The prevalence rate for its use was about half the reported domestic prevalence rate for "ecstasy" use (0.6 per cent), slightly higher than the rate for non-prescribed amphetamines (0.2 per cent) and far higher than the lifetime prevalence rate for the use of crack cocaine (0.1 per cent) or heroin (0.1 per cent).[134]

An earlier household survey conducted in Brazil in 2005 found a lifetime prevalence rate for ketamine use of 0.2 per cent among those aged 12 to 65. This was equivalent to the lifetime use of *merla*, a variant of smokeable cocaine paste/base, and greater than the prevalence of heroin use (0.09 per cent). Another NPS reported in the household survey from Brazil was "Benflogin" (benzydamine), with a lifetime prevalence rate of 0.4 per cent among the age group 12 to 65.[135] This is a locally acting medicine with anaesthetic and analgesic properties for treatment of inflammatory conditions of the mouth and throat. Taken in high doses, it is misused in Brazil and a few other countries as a central nervous system stimulant and deliriant (special class of hallucinogens).

An analysis, using Google Trends, of Internet searches via Google for the period 2005-2012 within Latin America revealed an interest in the terms "ketamine" or "ketamina", not only in Argentina and Brazil but also in Chile, Colombia, Mexico, Peru and Venezuela (Bolivarian Republic of).

Salvia divinorum, also known in Mexico as "*ska pastora*", "*ska María*", "*hierba María*" or "*hierba des los dioses*", appears to be popular (based on Google Internet searches) in various Latin American countries, including Argentina, Brazil, Chile, Costa Rica and Mexico. Originally used by shamans of the Mazatec tribe of Mexico for religious purposes and during spiritual healing sessions,[136] *Salvia divinorum* is currently popular for reasons well beyond its traditional use. It has already emerged as the second most widely offered NPS in 2011. At the beginning of 2012 it was offered in online shops in the European Union.[137]

133 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances*.

134 United Nations Office on Drugs and Crime, data from the annual report questionnaire.

135 Ibid.

136 Valdés and others, "Studies of *Salvia divinorum* (Lamiaceae), an hallucinogenic mint from the Sierra Mazateca in Oaxaca, Central Mexico".

137 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe*, p. 91.

The emergence of synthetic cathinones was reported by Brazil and Mexico.[138] Again, interest in the various cathinone derivatives appears to be limited in Latin America. This may have to do with the ample availability of cocaine in the region.

Argentina, Brazil, Chile, Costa Rica and Mexico reported the emergence of piperazines on their markets. That problem also seems to be limited in scope. This may be attributed to the fact that the region is rather well supplied with "ecstasy", so there is no urgent need to look for alternative substances.

Oceania

The countries in the Oceania region seem to have some of the highest prevalence rates in the world for the use of NPS. This applies to New Zealand, which for many years played a key role in the market for piperazines. A large number of NPS are also found in Australia, similar to the situation in Europe and North America. Overall, 44 such substances were identified during the first two quarters of 2012 in the Oceania region, equivalent to more than a quarter of all NPS identified worldwide during this period.[139]

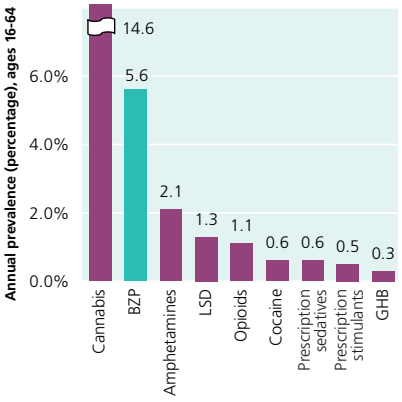
In addition, a "traditional" NPS is widespread in the various small island countries of the Oceania region, notably in the Western Pacific: kava, which is also exported to some overseas markets, including countries in Europe and the United States,[140] where it has been marketed as an anti-anxiety preparation. The roots of this plant are used to produce a drink with sedative and anaesthetic properties. In the Oceania region, kava is often used in combination with alcohol. Heavy use of kava was reported to lead to malnutrition, liver damage, renal dysfunctions, pulmonary hypertension, macrocytosis of red cells, lymphocytopenia and decreasing platelet volumes.[141]

New Zealand

One example of a rapidly expanding market for NPS over the past decade has been New Zealand. The country reported the appearance of a number of such substances on its market in recent years, including several synthetic cannabinoids, synthetic cathinones and phenethylamines.[142] However, its market for NPS has been associated mostly with the spread of piperazines. By 2007/08, i.e. prior to the classification of BZP as a class C drug[143] in April 2008, the national household survey in New Zealand revealed that 5.6 per cent of the population aged 15 to 64 had used BZP in the past year, more than twice the rate for amphetamines (2.1 per cent) and nine times the rate for cocaine (0.6 per cent). These were high levels by international standards. For instance, in the United Kingdom, Europe's largest market for such substances, the NPS with the highest prevalence rate (mephedrone) had only a 1.4 per cent prevalence rate among the general population in 2010/11. Beginning in 1999, BZP started to gain popularity as a rave drug in New Zealand, with such popularity later expanding to several other countries.[144] BZP was marketed as a "safer legal alternative" to methamphetamine.[145]

Following the scheduling of BZP as a class C drug in 2007, prevalence rates for its use declined substantially. As a consequence, the overall use of "legal highs" experienced a clear decline between 2005 and 2010 in New Zealand,[146] in contrast to the situation in many other countries.

Fig. 31. Annual prevalence of the use of new psychoactive substances, as compared with other drugs, among the general population (aged 16-64) in New Zealand, 2007/08



Source: Ministry of Health, *Drug Use in New Zealand: Key results of the 2007/08 New Alcohol and Drug Use Survey*, January 2010.

138 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

139 Ibid.

140 "Hepatic toxicity possibly associated with kava-containing products: United States, Germany, and Switzerland, 1999-2002", *Morbidity and Mortality Weekly Report*, vol. 51, No. 47 (2002), pp. 1065-1067.

141 Peter P. Fu and others, "Toxicity of kava kava", *Journal of Environmental Science and Health, Part C: Environmental Carcinogenesis and Ecotoxicology Review,* vol. 26, No. 1 (2008), pp. 89-112.

142 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

143 Class C substances with a "moderate risk" of harm. For more detail, see discussion under "Specific legislation on new psychoactive substances" below.

144 Thompson and others, "The benzylpiperazine/trifluoromethylphenylpiperazine and alcohol safety study: report for the Ministry of Health".

145 Bowden, "Non-traditional designer substances: a new category of psychoactives in New Zealand".

146 C. Wilkins and P. Sweetsur, "The impact of the prohibition of benzylpiperazine (BZP) 'legal highs' on the prevalence of BZP, new legal highs and other drug use in New Zealand", *Drug and Alcohol Dependence*, vol. 127, Nos. 1-3 (2013), pp. 72-80.

Australia

Australia identified 33 NPS during the first six months of 2012, fewer than the United States or Canada but similar to the number reported by the United Kingdom (38) and more than by New Zealand (15). Most of the NPS identified in Australia were synthetic cathinones (13) and phenethylamines (8).[147]

The national household survey lists only ketamine among NPS. This is, however, a controlled substance in Australia. The survey revealed a small decline in the annual prevalence rate for ketamine use among the population aged 14 and above, from 0.3 per cent in 2004 to 0.2 per cent in 2010. It is as common as heroin, methadone or buprenorphine (0.2 per cent each), more common than GHB (0.1 per cent) but less common than cocaine (2.1 per cent), methamphetamine (2.1 per cent) or "ecstasy" (3 per cent).[148]

This does not, however, seem to be an accurate reflection of the overall spread of NPS in the country. According to the Australian Crime Commission, Australian drug users consume a broad range of substitutes for amphetamine-type stimulants that are under control, including mephedrone and many other synthetic drugs. The authorities identified 500 different "legal highs", advertised mostly through overseas "legal high" stores.[149]

This perception is confirmed by studies of Australian users of amphetamine-type stimulants. The latest study revealed that 33 per cent of regular "ecstasy" and psychostimulant users in Australia in 2012 used an "emerging psychoactive substance" (excluding synthetic cannabinoids),[150] up from 28 per cent in 2011. Including synthetic cannabinoids, the percentage of persons using such substances rose to 40 per cent in 2012, suggesting that about half of the users of synthetic cannabinoids also used other emerging psychoactive substances.

The most frequently used emerging psychoactive substances in 2012 were synthetic cannabinoids, used by 15 per cent of all regular "ecstasy" and psychostimulant users, up from 6 per cent in 2011. In contrast to other such substances, synthetic cannabinoids did not feature in previous reports. This suggests that their spread was previously very limited.

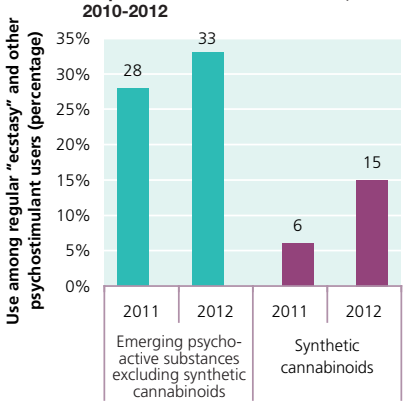
147 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

148 Australian Institute of Health and Welfare, *2010 National Drug Strategy Household Survey Report*, Drug Statistics Series No. 25 (Canberra, July 2011). Available from www.aihw.gov.au/publication-detail/?id=32212254712.

149 Australian Crime Commission, "Crime markets: illicit drug markets–drug analogues and other synthetic drugs". Available from www.crimecommission.gov.au/publications/organised-crime-australia/2011-report/crime-markets.

150 L. Scott and L. Burns, *New South Wales Trends in Ecstasy and Related Drug Markets 2011: Findings from the Ecstasy and Related Drugs Reporting System (EDRS)*, Australian Drug Trends Series No. 83 (Sydney, University of New South Wales, National Drug and Alcohol Research Centre, 2011).

Fig. 32. Use of emerging psychoactive substances over the past six months among frequent "ecstasy" and amphetamine users in Australia, 2010-2012



Source: University of New South Wales, National Drug and Alcohol Research Centre, "Australian drug trends 2012: findings from the Ecstasy and Related Drugs Reporting System", Drug Trends Conference handout (Sydney, 2012).

The two next most widely used such substances were dimethyltryptamine, or DMT (12 per cent), a hallucinogenic substance, and 4-bromo-2,5-dimethoxy-phenethylamine, or 2C-B (9 per cent), a psychedelic phenethylamine. Both substances are under international control. The use of these substances remained more or less stable.

The next most frequently identified substances were mephedrone (5 per cent among regular users of "ecstasy" and psychostimulants) and methylone/bk MDMA, an "ecstasy" derivative (5 per cent), followed by MDPV (2.5 per cent), dextromethorphan (2.5 per cent), *Salvia divinorum* (2.5 per cent), mescaline (2 per cent), LSA, which is a psychedelic ergoline alkaloid related to LSD (2 per cent), and various psychedelic phenethylamines, notably 2,5-dimethoxy-4-iodo-phenethylamine, or 2C-I (2 per cent), 2,5-dimethoxy-4-ethyl-phenethylamine, or 2C-E (2 per cent), and BZP (1 per cent).[151]

Asia

According to the UNODC survey undertaken in 2012, the second largest number of countries reporting the emergence of NPS was in Asia. The emergence of such substances was reported from a number of countries and areas, mostly in East and South-East Asia (Brunei Darussalam; China; Hong Kong, China; Indonesia; Japan; Philippines; Singapore; Thailand; and Viet Nam), as well as in the

151 University of New South Wales, National Drug and Alcohol Research Centre, "Australian drug trends 2012: findings from the Ecstasy and Related Drugs Reporting System", Drug Trends Conference handout (Sydney, 2012).

Middle East (Bahrain, Israel, Jordan, Oman, Saudi Arabia and the United Arab Emirates). Most NPS to emerge in Asia during the first two quarters of 2012 were identified by the authorities of Israel (27), Singapore (11) and Hong Kong, China (7).

Hong Kong, China, reported the emergence of a number of synthetic cannabinoids (such as JWH-018) and synthetic cathinones (4-methylethcathinone and butylone). Indonesia informed UNODC of the emergence of BZP. Singapore saw the emergence of a number of synthetic cannabinoids (including JWH-018) and synthetic cathinones (3-fluro-methcathinone and 4-methylethcathinone). Oman witnessed the emergence of synthetic cannabinoids (JWH- 018). Synthetic cannabinoids, as reflected in Internet searches, also appear to have played a role in India, at least since mid-2010. Japan reported the emergence of phenethylamines, synthetic cathinones, piperazines, ketamine, synthetic cannabinoids and plant-based substances.[152]

The two main NPS in Asia in terms of consumption seem to be ketamine and kratom, mostly affecting the countries of East and South-East Asia. Ketamine pills have been sold for several years as a substitute for "ecstasy" (and sometimes even as "ecstasy"). In addition, large-scale traditional consumption of khat is present in Western Asia, notably in Yemen.

Ketamine

High levels of ketamine use have long been reported from East and South-East Asia:[153]

- Hong Kong, China, and Macao, China, identified ketamine as the second most widely used drug in 2011
- China reported ketamine as the fourth most widely used substance in 2010 and the third in 2011
- In Brunei Darussalam, ketamine was the fourth most widely used substance in 2011
- In India and Myanmar, ketamine was the fifth most widely consumed substance in 2010 and in Japan in 2008
- Singapore identified ketamine as the sixth most widely used substance in 2011
- Indonesia identified ketamine as the seventh most widely used substance in 2009.

Ketamine also plays a role in the Near and Middle East:

- Saudi Arabia identified ketamine as the seventh most widely used substance in 2010
- Israel reported it as the ninth most used substance in 2011.

Ketamine is more widely used in East and South-East Asia than in the Americas and Europe.

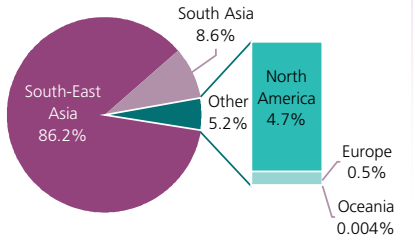
152 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

153 United Nations Office on Drugs and Crime, data from the annual report questionnaire.

Fig. 33. Ketamine seizures in Asia and globally, 2001-2011

Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire.
[a] Preliminary data.

Fig. 34. Global ketamine seizures, by region, 2001-2011

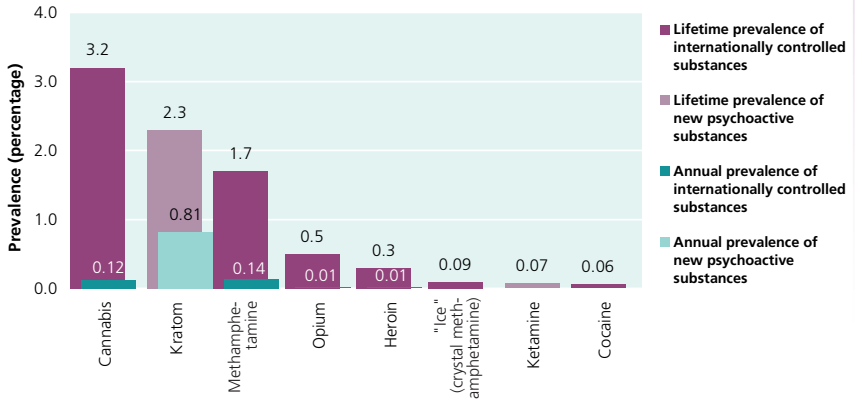


Source: United Nations Office on Drugs and Crime, data from the annual report questionnaire.

The importance of ketamine is also reflected in seizure statistics, which showed an upward trend over the past decade, although the number of seizures seems to have stabilized or even declined in recent years. Over the period 2001-2011, 14 Asian countries (out of 30 countries worldwide) reported seizures of ketamine to UNODC. They accounted for 95 per cent of all ketamine seized worldwide.

The concentration is most pronounced in East and South-East Asia (86 per cent of global seizures), followed by South Asia (9 per cent). The single largest seizures during the period 2001-2011 were reported from China (58 per cent of global ketamine seizures), followed by Taiwan Province of China (13 per cent), India (9 per cent), Hong Kong, China (5 per cent), and Malaysia (5 per cent). Smaller amounts were reported from Myanmar (3 per cent), Thailand (1 per cent), Indonesia (1 per cent) and the Philippines (1 per cent), followed by Singapore; Macao, China; Viet Nam; Cambodia; and Brunei Darussalam.

Fig. 35. Lifetime and annual prevalence of drug use in Thailand, 2007



Source: Thailand, Office of the Narcotics Control Board, cited in United Nations Office on Drugs and Crime, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs in East and South-East Asia (and Neighbouring Regions): 2009* (Bangkok, 2009).

Kratom

Another NPS widely used in East and South-East Asia, notably in Malaysia, Myanmar and Thailand, is kratom (*Mitragyna speciosa*). The leaves of this plant have mild stimulant effects, in addition to effects similar to opioids, as well as some hallucinogenic properties. Kratom leaves are used in traditional medicine as an anti-diarrhoeal and in the treatment of opioid dependence.[154] The possession of kratom leaves has been illegal in Thailand since 1943; kratom is also controlled in a few other countries in the region (Malaysia and Myanmar) and outside the region (Australia, Bhutan, Finland and Lithuania).[155] A national household survey conducted in Thailand in 2007 suggested that kratom was the second most widely used drug after cannabis in terms of lifetime prevalence, and the most widely used drug in terms of annual prevalence (0.8 per cent of the adult population). Use levels far above average were reported from southern Thailand (4.6 per cent), i.e. in the areas where the *Mitragyna speciosa* plant is native.

Although use of kratom is very widespread, figures for treatment admissions for its use are rather low, accounting for 2,838 cases, or 2 per cent of all drug treatment admissions, in Thailand in 2011.[156] Consumption and related problems are on the rise, however. Kratom-related treatment admissions almost tripled between 2007 and 2011.[157]

Kratom seizures rose from 1.7 tons in 2005 to 23 tons in Thailand in 2011.[158] Kratom seizures in neighbouring Malaysia and Myanmar reached record levels that year, at roughly one ton each.[159] The number of seizures of kratom quintupled in Thailand, from 1,100 in 2005[160] to 5,897 in 2011, and was far higher than those reported for heroin (832), opium (480), ketamine (156), "ecstasy" (144) or cocaine (58).[161]

Kratom-related arrests more than doubled between 2007 and 2011 in both Myanmar and Thailand. In Myanmar, they increased from 89 to 211 during this period. Thailand reported 13,134 kratom-related arrests in 2011 (5 per cent of all drug-related arrests), up from 5,571 in 2007.[162]

In addition to widespread consumption of kratom in South-East Asia, use of the substance was also reported in

154 Australia, National Drugs and Poisons Schedule Committee, "Comments on kratom and mitragyine", thirty-ninth meeting, October 2003.

155 NeuroSoup, "Kratom *Mitragyna speciosa*". Available from www.neurosoup.com/kratom.htm.

156 Far fewer people were treated for kratom than for methamphetamine (165,044). Nonetheless, there were more people treated for kratom than for opium (2,601), heroin (2,115), "ecstasy" (172), cocaine (15) or ketamine (13) in 2011.

157 United Nations Office on Drugs and Crime, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs: Asia and the Pacific — 2012* (Bangkok, 2012).

158 Thailand, Office of the Narcotics Control Board, *Thailand Narcotics Control: Annual Report 2011*, No. 1-19-2555, ISSN 978-616-7187-97-6 (Bangkok, 2012).

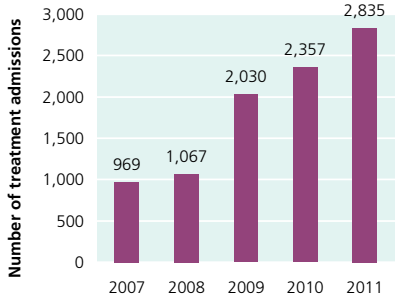
159 United Nations Office on Drugs and Crime, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs: Asia and the Pacific — 2012.*

160 Thailand, Office of the Narcotics Control Board, *Thailand Narcotics Control: Annual Report 2011.*

161 Thailand, Office of the Narcotics Control Board, statistics on drug cases throughout the country, 1 January-31 December 2011. Available from http://en.oncb.go.th/document/2011Arrested-s.pdf.

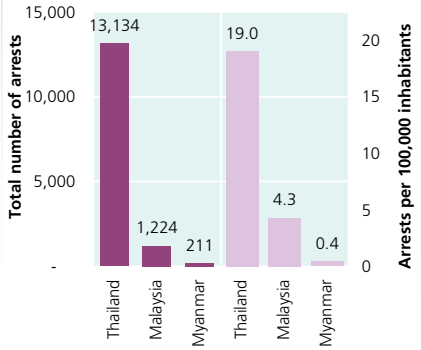
162 United Nations Office on Drugs and Crime, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs: Asia and the Pacific — 2012* (Bangkok, 2012).

Fig. 36. Kratom-related treatment admissions in Thailand, 2007-2011



Source: United Nations Office on Drugs and Crime, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs: Asia and the Pacific — 2012* (Bangkok, 2012).

Fig. 37. Kratom-related arrests in South-East Asia, 2011



Source: United Nations Office on Drugs and Crime, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs: Asia and the Pacific — 2012* (Bangkok, 2012).

the Republic of Korea[163] and, in recent years, it has also emerged as a NPS in a number of North American, European and Middle Eastern countries.[164] In the European Union, kratom was the most widely offered NPS in "online shops" in 2011 and at the beginning of 2012.[165]

Khat

Khat has been reported as a NPS in several countries in the Americas, Europe, the Oceania region, the Middle East and East Asia. It is a traditional drug in Yemen, where it is legal. According to a survey conducted under the auspices of the World Bank, 72 per cent of Yemeni males and 33 per cent of Yemeni females aged 12 and above reported the chewing of khat in 2006, with more than half of the users chewing it daily. The rates were even higher in areas where khat is cultivated. Overall, khat is used by 52 per cent of the Yemeni population age 12 and above.[166] These rates are far higher than those for any other psychoactive substance reported by any country in the world (except for alcohol, tobacco or caffeine). About 70 per cent of households in Yemen reported having at least one khat user.

The negative consequences of khat use for the individual may not be as severe as in the case of other drugs, as indicated by the 2006 WHO Expert Committee, which concluded in its critical review that no international scheduling was required.[167] Nonetheless, some 70 per cent of Yemeni female users and 80 per cent of Yemini male users reported adverse health effects. Khat use was often found to be associated with tooth decay, high blood pressure, sleeplessness, constipation and, in some cases, depression, paranoia and oral cancer.[168] There are also negative socioeconomic effects. Productivity is negatively affected, at both the micro and the macro level, which is problematic, as Yemen is already a least developed country, the only one on the Arabian peninsula. Even though khat is legal and prices are thus low, some 10 per cent of the household budget, on average, is used for khat, increasing to more than a quarter among poorer families. Close to a fifth of all khat-using households are forced to borrow money to finance their habit. In parallel to the rise in consumption, there has been a rapid increase in the area under cultivation, which rose 13-fold over the last three decades (from some 8,000 ha to more than 100,000 ha), thus depleting scarce water resources (one third of groundwater extraction is linked to the cultivation of khat) and crowding out production of essential food crops and agricultural exports.[169]

Manufacture of new psychoactive substances

Asia plays a key role when it comes to the manufacture of NPS. In addition to khat production in West Asia for the local market, most of the other NPS found on markets worldwide, including most synthetic cannabinoids,

163 United Nations Office on Drugs and Crime, *Patterns and Trends of Amphetamine-Type Stimulants and Other Drugs: Asia and the Pacific — 2012* (Bangkok, 2012).

164 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

165 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2012: The State of the Drugs Problem in Europe*, p. 91.

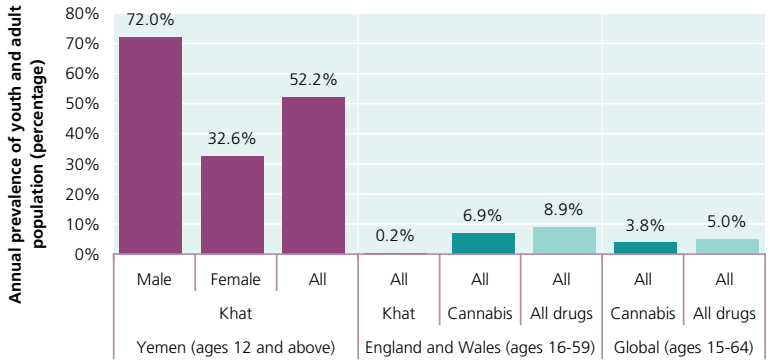
166 World Bank, "Yemen toward qat demand reduction", report No. 39738-YE (June 2007).

167 World Health Organization, "Assessment of khat (*Catha edulis Forsk*)", prepared for the thirty-fourth meeting of the Expert Committee on Drug Dependence (document 2006/4.4). Available from www.who.int/medicines/areas/quality_safety/4.4KhatCritReview.pdf.

168 N. Numan, "Exploration of adverse psychological symptoms in Yemeni khat users by the Symptoms Checklist-90 (SCL-90)", *Addiction*, vol. 99, No. 1 (2004), pp. 61-65; World Bank, "Yemen: towards qat demand reduction".

169 World Bank, "Yemen: towards qat demand reduction".

Fig. 38. Khat use in Yemen,[a] 2006, as compared to drug use in England and Wales (2011/12) and globally (2010)



Source: World Bank, "Yemen: towards qat demand reduction", report No. 39738-YE (June 2007); United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales*, 2nd ed. (London, July 2012); and *World Drug Report 2012* (United Nations publication, Sales No. E.12.XI.1).

[a] Based on a sample of 4,027 persons.

cathinone derivatives and ketamine, appear to originate in Asia, notably in countries of East Asia and South Asia, which have advanced chemical and pharmaceutical industries. In fact, the UNODC survey of NPS revealed that Asia was the primary region of production of such substances, ahead of Europe and the Americas. NPS found on the markets of Asian countries appear to originate almost exclusively within the region. In addition, most European and North American countries, as well as Australia, identified Asia as the primary source for NPS. In Asia, the most frequently named source countries for such substances were China and India.[170]

Africa

In total, 7 African countries (Angola, Cape Verde, Egypt, Ghana, South Africa, Togo and Zimbabwe) out of the 10 that replied to the survey reported the emergence of NPS to UNODC. Egypt reported the emergence of not only plant-based substances (*Salvia divinorum*) but also synthetic cannabinoids, ketamine, piperazines (BZP) and other substances (2-diphenylmethylpiperidine (2-DPMP) and 4-benzylpiperidine).[171]

Nonetheless, the overall problems related to the production and consumption of NPS appear to be less pronounced in Africa. There are, however, a number of traditionally used substances (such as khat or ibogaine) that fall into the category of NPS and that, in terms of their spread, cause serious health problems and other social consequences.

Khat

Khat is produced and used widely in many of the countries along the Red Sea and the Indian Ocean, notably Djibouti, Ethiopia, Kenya and Somalia, and to a lesser extent Madagascar, Rwanda, South Africa, the Sudan, Uganda and the United Republic of Tanzania. The legal status of khat differs in the various African countries. Khat is legal in Djibouti, Ethiopia, Kenya and Somalia, but controlled in other countries, including Eritrea, Rwanda, the Sudan and the United Republic of Tanzania.[172] The largest khat seizures in Africa during the period 2005-2011 were reported by the United Republic of Tanzania, followed by Zambia, the Sudan, Eritrea and Egypt.[173]

Somalia is one of the key destination countries within Africa. Exports to overseas markets are often destined for expatriate Somali communities, as well as expatriate communities from neighbouring countries. The export of khat to overseas markets in Europe, North America, India and Australia originates mostly in Ethiopia, the Kenyan highlands and Yemen.[174]

According to information provided by the United States State Department, khat is now the fourth-largest Ethiopian export, up from seventh place a few years earlier, and khat

170 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

171 Ibid.

172 D. M. Anderson and N.C.M. Carrier, *Khat: Social Harms and Legislation — A Literature Review*, Occasional Paper 95 (London, Home Office, July 2011).

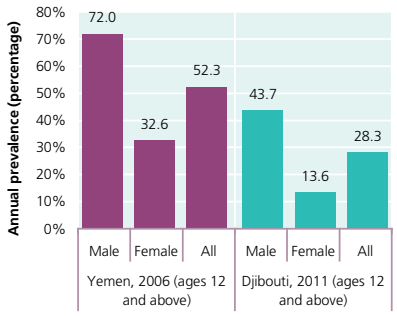
173 United Nations Office on Drugs and Crime, data from the annual report questionnaire.

174 Axel Klein, Pien Metaal and Martin Jelsma, "Chewing over khat prohibition: the globalisation of control and regulation of an ancient stimulant", Series on Legislative Reform of Drug Policies No. 17 (Transnational Institute, January 2012).

consumption, in line with rising levels of cultivation, is increasing. Large-scale khat cultivation also takes place in Kenya. This has led to rising exports, as well as increased domestic consumption. According to the 2010 report of the National Campaign Against Drug Abuse, khat (locally known as "*miraa*") appears to have emerged as the most commonly consumed drug in Kenya, ahead of cannabis.[175] During the period 2008-2012, Ethiopia and Kenya, followed by Yemen, had the largest numbers of Internet searches related to "khat", "qat" or "*miraa*" among countries in the region, at far higher levels than found in North America or in Europe.

Quantitative studies on the spread of khat in Africa are, however, limited. One study, done under the auspices of the World Bank in Djibouti, found that 28.2 per cent of the population aged 12 and above used khat, including 43.7 per cent of males and 13.6 per cent of females. Almost half of the households (49.7 per cent) had at least one khat user. These are high prevalence rates, although they are lower than in neighbouring Yemen. Khat consumption has been increasing in recent decades. Khat imports from neighbouring Ethiopia into Djibouti rose 82 per cent in volume terms between 1984 and 2004. In particular, the number of female khat users increased during the past 15 years, with the annual prevalence rate of 3 per cent in 1996 more than doubling to 7 per cent in 2006, and doubling again to almost 14 per cent by 2011.[176]

Fig. 39. Annual prevalence of khat use in Djibouti,[a] 2011, as compared with Yemen,[b] 2006



Source: World Bank, *Comprendre la dynamique du khat à Djibouti: Aspects sociaux, économiques et de santé*, report No. 62823-DJ (Washington, DC, 2011); World Bank, "Yemen: towards qat demand reduction", report No. 39738-YE (June 2007).

[a] Based on a sample of 4,309 persons.
[b] Based on a sample of 4,027 persons.

175 United States, Department of State, Bureau for International Narcotics and Law Enforcement Affairs, *International Narcotics Control Strategy Report*, vol. 1, *Drug and Chemical Control* (March 2012).

176 World Bank, *Comprendre la dynamique du khat à Djibouti : aspects sociaux, économiques et de santé*, report No. 62823-DJ (Washington, D.C., 2011).

The economic impact for Djibouti has also been substantial. Khat accounts for one third of total agricultural imports into Djibouti and is the third largest import item in monetary terms, after food and oil. Total expenditure on khat in 2008 was estimated to have been equivalent to 24 per cent of public development assistance or 66 per cent of foreign direct investment. The average expenditure by khat users was found to have been some 20 per cent of total household income. The typical khat user in Djibouti, i.e. a male between the ages of 18 and 25, consumes it daily and spends 40 per cent of his total income on khat.[177]

Other plant-based substances

Apart from khat, many parts of Africa are witness to widespread use of a number of other psychoactive plants that are not under international control. One of the better-known examples is ibogaine, a naturally occurring psychoactive substance found in a plant known as iboga (*Tabernanthe iboga*), native to West and Central African rainforests. It has traditionally been used in several countries of the region (Cameroon, Congo, Gabon and in parts of Nigeria), often in connection with traditional spiritual rituals[178] and administered by local shamans and healers.[179]

The iboga tree contains ibogaine, a hallucinogen with both psychedelic and dissociative properties. In addition, stimulant effects have been reported from chewing iboga root bark, thereby releasing small amounts of ibogaine into the body. Ibogaine also has the ability to potentiate morphine analgesia and has been used, outside Africa, to reduce addiction[180] to opioids[181] and, in animal experiments, to reduce addiction to cocaine.[182] Treatment centres exist, inter alia, in Mexico and New Zealand. Interest in ibogaine outside Africa, as reflected in Internet searches catalogued by Google Trends, seems to be mainly in Australia, Canada, France, the Netherlands, the United Kingdom and the United States. Its use is not without problems, however. One of the negative side effects of ingesting large doses of ibogaine is ataxia, or difficulty in coordinating muscle motion. Other potential side effects may include xerostomia, nausea and vomiting. More problematically, studies have suggested the possibility of adverse interaction with heart conditions. Ibogaine has been observed to increase

177 Ibid.

178 Kenneth R. Alper, Howard S. Lotsof and Charles D. Kaplan, "The ibogaine medical subculture", *Journal of Ethnopharmacology*, vol. 115, No. 1 (2008), pp. 9-24; Nick Sandberg, "Iboga tourism in Central Africa", 21 March 2012 (see www.ibogaine.co.uk/iboga-tourism.htm).

179 Ed Platt, "The Dreaming", *Independent*, 28 March 1999.

180 Kenneth R. Alper, "Ibogaine: a review", in *Ibogaine: Proceedings of the First International Conference*, Kenneth R. Alper and Stanley D. Glick, eds. (San Diego, California, Academic Press, 2001).

181 S. D. Glick and others, "Effects and aftereffects of ibogaine on morphine self-administration in rats", *European Journal of Pharmacology*, vol. 195, No. 3 (1991), pp. 341-345.

182 S.L.T. Cappendijk and M. R. Dzoljic, "Inhibitory effects of ibogaine on cocaine self-administration in rats", *European Journal of Pharmacology*, vol. 241, Nos. 2-3 (1993), pp. 261-265.

sinus arrhythmia, leading to ventricular tachycardia. Fatalities following ingestion of ibogaine have been linked to lethal respiratory and cardiac effects. Consequently, ibogaine and its salts have been controlled in the United States since 1967 as a Schedule I substance, and it is also controlled in Belgium and Switzerland.[183]

Impact of regulations on changes in the use of new psychoactive substances

It has generally been observed that when a NPS is controlled, its use declines, which in turn has a positive impact on health-related consequences, including deaths related to the substance. The control system does not have a uniform impact on all substances and markets, however.

Data have shown that controlling a substance may have different impacts, for example:

(a) The substance remains on the market, but prevalence of its use declines immediately. Examples include mephedrone in the United Kingdom, BZP in New Zealand, "legal highs" in Poland and mephedrone in Australia;

(b) Use of the substance declines after a longer interval, maybe a year or more (e.g. ketamine in the United States);

(c) The scheduling has little or no immediate impact on the use of the substance, e.g. use of MDMA ("ecstasy") in the United States and other countries, which did not decline until two decades later, following improved precursor controls.

It has also been observed that a substance can largely disappear from the illicit market. This has been the case with the majority of the substances controlled under the 1961 Convention and the 1971 Convention. Out of 234 substances currently under international control, only a few dozen are still being misused, and the bulk of the misuse is concentrated in a dozen such substances.

It is clear that a holistic approach involving a number of factors — prevention and treatment, legal status, improving precursor controls, cracking down on trafficking rings — has to be applied to tackle the situation.

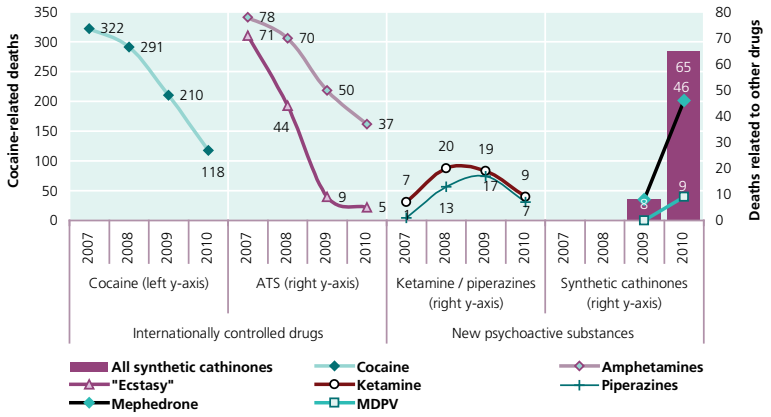
A more in-depth look at various responses in terms of legal status is presented below.

(a) *Immediate decline in the use of new psychoactive substances*

(i) Mephedrone and the United Kingdom

Prior to the introduction of controls for the various synthetic cathinones in the United Kingdom, consumption of mephedrone increased notably. Hardly known a few years earlier, by 2010/11 mephedrone had emerged as the third most widely used drug among the general population (ages 16-59) and was even the second most widely used drug among young persons aged 16 to 24 in England and Wales.[184] All of this resulted in major negative health consequences, including a strong rise in mephedrone-related deaths. By 2010, the number of such deaths had already exceeded the number of deaths related to the abuse of

Fig. 40. Number of deaths related to controlled stimulants and to new psychoactive substances in the United Kingdom, 2007-2010, prior to the control of synthetic cathinones

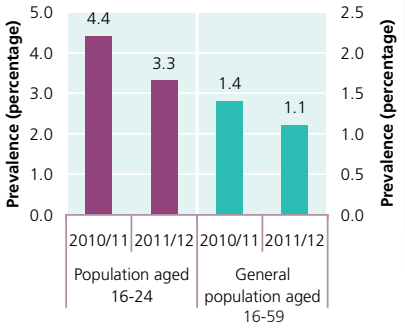


Source: Hamid Ghodse and others, *Drug-related Deaths in the United Kingdom: Annual Report 2011* (International Centre for Drug Policy, St. George's, University of London, London, 2012).

183 Multidisciplinary Association for Psychedelic Studies, "Ibogaine therapy for drug addiction" (see www.maps.org/research/ibogaine).

184 United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales*.

Fig. 41. Annual prevalence of the use of mephedrone in England and Wales, fiscal years 2010/11 and 2011/12



Source: United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales*, 2nd ed. (London, July 2012).

Fig. 42. Changes in the annual prevalence of BZP use in New Zealand, 2006 (prior to control) **and 2009** (one year after control)

Source: C. Wilkins and P. Sweetsur, "The impact of the prohibition of benzylpiperazine (BZP) 'legal highs' on the prevalence of BZP, new legal highs and other drug use in New Zealand", *Drug and Alcohol Dependence*, vol. 127, Nos. 1-3 (2013), pp. 72-80.

amphetamine-type stimulants, which had declined sharply during the 2007-2010 period.

The situation changed following the classification of mephedrone as a class B substance under the Misuse of Drugs Act in 2010 and an import ban on 29 March 2011. Between fiscal year 2010/11 and fiscal year 2011/12, the annual prevalence of mephedrone among the general population aged 16 to 59 fell by a fifth; among those aged 16 to 24, it fell by as much as a quarter.[185] Internet surveys among clubgoers in the United Kingdom also confirmed the downward trend.[186] In parallel, the 2011 EMCDDA "snapshot" identified a major decrease in the number of online shops offering mephedrone in Europe, notably in the United Kingdom.[187]

(ii) Benzylpiperazine and New Zealand

In New Zealand, the use of NPS has for years been associated mainly with the use of benzylpiperazine (BZP), which used to be marketed as a "safer legal alternative" to methamphetamine.[188] Given the massive spike in the numbers for both BZP use and emergency-department visits linked to its abuse in the first few years of the new millennium, BZP was recommended for scheduling in 2007 and finally came under national control in 2008. Following its control, annual prevalence among the population aged 13 to 45 declined quickly, by almost 80 per cent between 2006 and 2009. Subsequent surveys of frequent users conducted in 2010 confirmed this trend. As a consequence, the overall use of "legal highs" witnessed a clear decline between 2005 and 2010 in New Zealand,[189] in contrast to the situation in many other countries.

The decline in the prevalence rate for the use of BZP in New Zealand is also reflected in massive declines in Internet searches for BZP. Nonetheless, most BZP-related Internet searches worldwide still took place in New Zealand during the period 2006-2012.

(iii) "Legal highs" and Poland

Poland was characterized by massive increases in "legal highs" in the decade 2001-2010. The most widespread NPS there used to be "Tajfun", a herbal mixture containing some synthetic cannabinoids. The rise in the use of "legal highs" went hand in hand with aggressive marketing activities. As of mid-2010, "legal highs" could be purchased in more than 1,100 shops across the country, up from 40 shops in 2008 and none in 2007. The rapid rise in the use of "legal highs" and reports of negative health consequences eventually prompted the authorities to amend their control regime.

Following the control of BZP and JWH-018 (a synthetic cannabinoid contained in herbal mixtures) in 2009, the list of controlled substances was extended to mephedrone and seven synthetic cannabinoids as of August 2010.[190] After more than 300 poisonings and 18 deaths in 2010, the Minister of Health ordered "in-depth checks", result-

185 United Kingdom, Home Office, *Drug Misuse Declared: Findings from the 2011/12 British Crime Survey for England and Wales.*

186 "Mixmag's Drug Survey: the results", March 2012. Available from www.mixmag.net/drugssurvey.

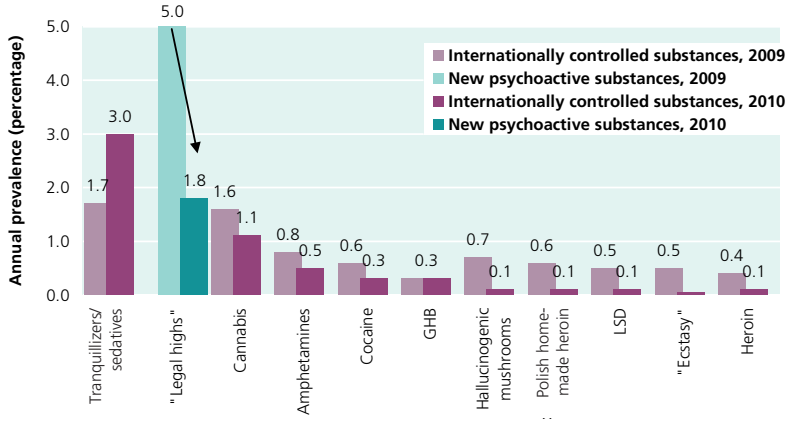
187 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2011: The State of the Drugs Problem in Europe* (Luxembourg, Publications Office of the European Union, 2011).

188 M. Bowden, "Non-traditional designer substances: a new category of psychoactives in New Zealand", April 2004. Available from www.erowid.org/chemicals/bzp/bzp_info1.shtml.

189 Wilkins and Sweetsur, "The impact of the prohibition of benzylpiperazine (BZP) 'legal highs' on the prevalence of BZP, new legal highs and other drug use in New Zealand".

190 Lucyna Kapka-Skrzypczak and others, "Legal highs: legal aspects and legislative solutions", *Annals of Agricultural and Environmental Medicine*, vol. 18, No. 2 (2011), pp. 304-309.

Fig. 43. Annual prevalence of new psychoactive substances, compared with illicit drugs, among the general population, aged 15-75, in Poland,[a] 2009 and 2010



Source: Artur Malczewski, "Psychoactive substance use in general population in 2010: survey results" (Warsaw, National Bureau for Drug Prevention, 2011).

[a] Sample: 1,001 (excluding cannabis).

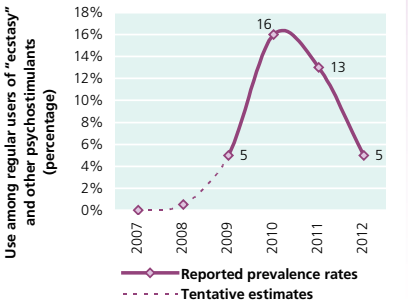
ing in the closure in October 2010 of over 900 of the 1,100 "legal high" shops. In particular, premises selling "Tajfun" were closed down.[191] Subsequently, a general ban on so-called "substitute substances" (defined as substances used instead of a scheduled narcotic drug or psychotropic substance) was introduced.[192]

The immediate effects of this move on the prevalence rates for the use of "legal highs" were positive. The reported annual prevalence rate for the use of "legal highs" fell by more than 60 per cent, from 5 per cent in December 2009 to 1.8 per cent in December 2010, according to a national drug use survey.[193] The decline in "legal highs" was not compensated for by an increase in the use of other drugs. In fact, the use of most drugs (except tranquillizers and sedatives) declined as well.

(iv) Mephedrone and Australia

From negligible levels in 2007, mephedrone use among users of amphetamines and "ecstasy" in Australia rose steadily until 2010. In that year, the Australian authorities made use of the Controlled Substance Analogue Act, specifying that mephedrone was an analogue of methcathinone and thus controlled.[194] Imported mephedrone was confiscated and the persons involved in the transactions were arrested.[195] Mephedrone was subsequently added to the federal

Fig. 44. Use of mephedrone over the prior six months among regular "ecstasy" and psychostimulant users in Australia, 2007-2012



Source: University of New South Wales, National Drug and Alcohol Research Centre, "Australian drug trends 2012: findings from the Ecstasy and Related Drugs Reporting System", Drug Trends Conference handout (Sydney, 2012) (and previous years); and tentative estimates of the United Nations Office on Drugs and Crime for the years 2007 and 2008, based on qualitative information from various sources.

191 Artur Malczewski and others, *2011 National Report (2010 Data) to the EMCDDA by the Reitox National Focal Point: Poland — New Development, Trends and In-depth Information on Selected Issues* (Warsaw, National Bureau for Drug Prevention, 2011). Available from www.emcdda.europa.eu/attachements.cfm/att_191625_EN_Poland_2011.pdf.

192 Artur Malczewski and others, *2010 National Report (2009 Data) to the EMCDDA by the Reitox National Focal Point: Poland.*

193 Artur Malczewski, "Psychoactive substance use in general population in 2010: survey results" (Warsaw, National Bureau for Drug Prevention, 2011).

194 "'Miaow' drug seized in mail busts", *Sydney Morning Herald*, 12 February 2010. Available from www.smh.com.au/national/miaow-drug-seized-in-mail-busts-20100212-nwad.html.

195 Australian Customs and Border Protection Service, "'Legal Highs' not

drug watch list;[196] by 2011, most of the individual states in Australia had brought mephedrone under control. In parallel, the use of mephedrone declined from a peak of 16 per cent among users of "ecstasy" and amphetamines in 2010 to 5 per cent in 2012.

(v) Methylenedioxypyrovalerone and the United States

A more recent example of a substance placed under control in the United States is methylenedioxypyrovalerone (MDPV), a synthetic cathinone that has generated a great deal of controversy, as some of its users have been reported to pose a threat to local communities and to harm themselves by means of self-mutilation and suicide attempts.[197] The drug causes what the police have dubbed a "hallucinatory delirium", making the users paranoid, violent and unpredictable, which has led to a number of killings.

Data on changes in the prevalence of use of MDPV are not available. However, data show that the number of calls to poison control centres concerning "bath salts" (often linked to MDPV) rose from 304 in 2010 to 6,134 in 2011, a 20-fold increase in one year.[198]

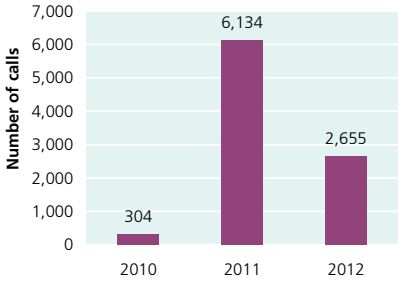
Following the control of the main "bath salts", starting with the "emergency scheduling" of MDPV, mephedrone and methylone in October 2011, calls to poison control centres related to "bath salts" fell by more than half in 2012. All of this suggests that the problems related to "bath salts", including MDPV, declined following the control of those substances.

(b) Decline in the prevalence or use of a new psychoactive substance after a longer interval

Ketamine and the United States

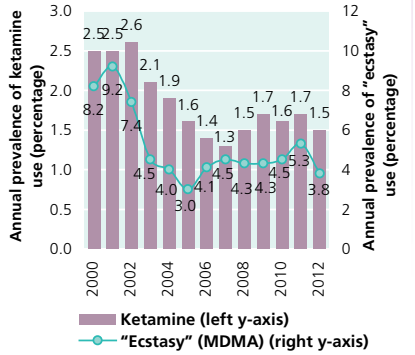
Ketamine was scheduled under the United States Controlled Substances Act in 1999. Subsequently, prevalence rates among twelfth-grade students fell from 2.5 per cent in 2000 to 1.5 per cent in 2012, a decline of 40 per cent. This was a remarkable success. At the same time, the perceived riskiness of "ecstasy" use increased[199] and the availability of "ecstasy" has declined over the past decade.[200]

Fig. 45. Calls to United States poison control centres for human exposure related to "bath salts", 2010-2012



Source: American Association of Poison Control Centers, "Bath salts data", updated 28 February 2013. Available from https://aapcc.s3.amazonaws.com/files/library/Bath_Salts_Data_for_Website_2.282013.pdf.

Fig. 46. Annual prevalence of ketamine and MDMA ("ecstasy") use among twelfth-grade students in the United States, 2000-2012



Source: United States, National Institute on Drug Abuse, Monitoring the Future survey, December 2012.

All of this has contributed to a decline in the use of "ecstasy". Without the introduction of appropriate control measures for ketamine, the decline in the availability of "ecstasy" could have been expected to lead to substantial increases in the use of ketamine, as the latter substance often serves as a substitute drug for the former.

(c) Legal controls that had no immediate impact on the use of NPS

MDMA ("ecstasy") and the United States

The fact that a "one size fits all" solution does not work is best exemplified by the case of MDMA ("ecstasy"), which

necessarily legal", November 2010. Available from http://customs.gov.au/webdata/resources/files/LegalHighsFactSheet.pdf.

196 Erowid, "4-methylmethcathinone: legal status", 3 March 2008. Available from www.erowid.org/chemicals/4_methylmethcathinone/4_methylmethcathinone_law.shtml.

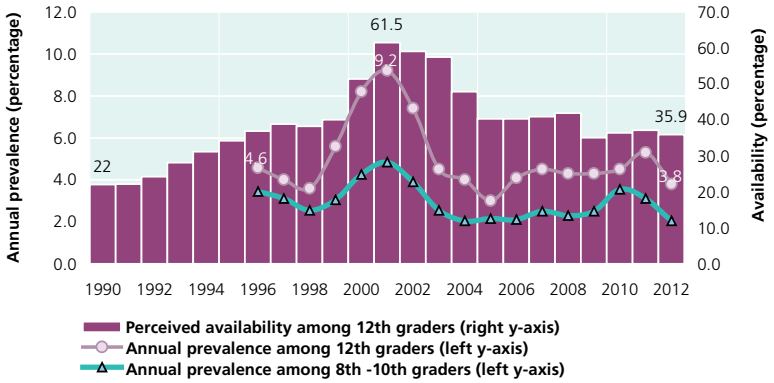
197 E. A. Ross, M. Watson and B. Goldberger, "'Bath salts' intoxication", *New England Journal of Medicine*, vol. 365, No. 10 (8 September 2011).

198 Kevin Dolak, "'Bath salts': use of dangerous drug increasing across U.S.", *ABC News*, 5 June 2012.

199 The proportion of twelfth-grade students reporting that it was a "great risk" to try "ecstasy" once or twice rose from 37.9 per cent in 2000 to 49.4 per cent in 2012, equivalent to an increase of 30 per cent in the perceived risk during this period (see United States, National Institute on Drug Abuse, Monitoring the Future survey, January 2013).

200 The proportion of twelfth-grade students reporting that it was "fairly easy" or "very easy" to get "ecstasy" (MDMA) fell from 51.4 per cent in 2000 to 35.9 per cent in 2012, equivalent to a deterioration of availability of 30 per cent (see United States, National Institute on Drug Abuse, Monitoring the Future survey, December 2012).

Fig. 47. Perceived availability[a] and prevalence of MDMA ("ecstasy") use among high-school students in the United States



Source: United States, National Institute on Drug Abuse, Monitoring the Future survey, December 2012.

[a] Proportion of students reporting that it was "fairly easy" or "very easy" to get "ecstasy".

was first scheduled in the United States in 1985 and at the international level in 1986 and thus ceased to be an NPS. Despite national and international controls, "ecstasy" availability increased markedly in the United States and in several other countries between the mid-1980s and 2000. In parallel, the perceived riskiness linked to the use of "ecstasy" declined.

The decline in "ecstasy" use after 2000 in the United States was mainly the result of reduced availability, as the established trafficking rings supplying the United States from the Netherlands were largely dismantled. In addition, the perceived riskiness linked to the use of "ecstasy" increased during the period 2000-2012,[201] indicating progress made in prevention efforts.

However, in parallel to the declining availability of "ecstasy" during the past decade, a number of other uncontrolled substances emerged, thus offsetting some of the declines reported.

Controlling new psychoactive substances: realities and challenges

New drugs of abuse and the international drug control system

The emergence of NPS on the drug scene is not per se a new phenomenon. Until recently, the control system was well able to cope with this phenomenon, but it is now reeling under the impact of the rapid proliferation of NPS.

The emergence of new substances that are legally manufactured by the pharmaceutical industry, with potential for abuse, started to create problems in an increasing number of countries in the late 1920s. As a result, a number of new narcotic analogues were placed under international control under the 1931 Convention for Limiting the Manufacture and Regulating the Distribution of Narcotic Drugs. The 1931 Convention also introduced, for the first time, the principle of "drug scheduling", i.e. applying different control levels based on the degree of danger and the extent to which a substance was required by the medical profession.[202] It also enabled binding extensions of the control regime, based on decisions by the League of Nations Health Organization, the predecessor of today's World Health Organization (WHO). However, that authority was limited to two groups, namely alkaloids linked to opium and to coca leaf.[203] Thus, the "similarity principle" entered international drug control, i.e. the provisions applied to all drugs with similar harmful effects and abuse liabilities, as long as they were chemically related to the two groups. With the 1948 Protocol amending the Agreements, Conventions and Protocols on Narcotic Drugs, this principle was extended to the 1925 International Opium Convention, authorizing WHO to extend the scope of control to "any narcotic drug" that WHO found to be "liable to similar abuse and productive of similar ill effects" as the substances already controlled.[204] The 1931 Convention also introduced — for the first time — measures for "provisional control",[205] a kind of emergency scheduling

201 United States, National Institute on Drug Abuse, Monitoring the Future survey, December 2012.

202 Thomas Pietschmann, "A century of international drug control", *Bulletin on Narcotics*, vol. LIV, Nos. 1 and 2 (2007) (United Nations publication, Sales No. 10.XI.6), p. 76.

203 *Commentary on the Single Convention on Narcotic Drugs*, 1961 (United Nations publication, Sales No. E.73.XI.1), p. 84.

204 Ibid., p. 74.

205 Symal Kuman Chatterjee, *Legal Aspects of International Drug Control* (The Hague, Martinus Nijhoff, 1981), p. 344.

system, to bridge the gap between the identification of a problem and the time needed by WHO to come to a conclusion on whether the new substance should be controlled.

After the Second World War, a number of new synthetic opioids developed during the war emerged on the market. Those substances were no longer opium-based and therefore could not be added by WHO to those controlled under the 1931 Convention. A new instrument had to be created, the Protocol bringing under International Control Drugs Outside the Scope of the 1931 Convention, which extended the controls of the 1931 Convention to synthetic opioids. In order to be able to react faster in the future, the 1948 Protocol contained a broadened "similarity principle". In theory, the system would work even before a synthetic opioid was manufactured and reached the market: the drug would be controlled when it was still in the laboratory test phase.[206] In total, 14 new synthetic opioids came under control in 1949 (including methadone and pethidine) and a further 6 by 1954. It is believed that this control helped to prevent a massive spread of these substances.[207]

The various international instruments (1912 Hague Convention, three conventions formulated under the League of Nations in 1925, 1931 and 1936 and a number of drug-related protocols, often established on an ad hoc basis) rendered the overall drug control system increasingly complex. Thus, from 1948 to 1961, negotiations took place to create a "single convention".

With the signing of the Single Convention on Narcotic Drugs of 1961, 85 substances were placed under international control, including cannabis, cocaine, opium, morphine, heroin, methadone, codeine, oxycodone and desomorphine. Today, 119 narcotic drugs are controlled under the 1961 Convention.[208] Most of the drugs added after 1961 were synthetic opioid analgesics, including fentanyl (scheduled in 1964) and several of its derivatives (scheduled between 1988 and 1990). The last drug that was brought under control by the 1961 Convention in 2007, was oripavine, an opiate and major metabolite of thebaine and parent compound of buprenorphine.

Soon after the 1961 Convention was concluded, increasing problems were reported with new types of synthetically produced psychoactive substances other than opioids, including barbiturates, LSD and stimulants (methamphetamine, amphetamine). As restrictions had already been introduced in several developed countries, pharmaceutical companies turned their attention to markets in Latin America, Africa and Asia, and cultivated them aggressively. The misuse of those substances developed into a global phenomenon.[209] The problem lay in the fact that some of those substances had a broad spectrum of legitimate uses. It was feared that by putting them under the strict control regime of the 1961 Convention, their legitimate use could suffer.

To tackle this new situation, the Convention on Psychotropic Substances of 1971 was adopted. That Convention has greater flexibility in weighing the therapeutic useful-

Procedures foreseen to put (new) psychoactive substances under international control under the 1961 Single Convention

Article 3 of the 1961 Single Convention foresees that if either a party (i.e. a Member State) or the World Health Organization (WHO) has information which in its opinion may require an amendment to any of the Schedules of the Convention, it shall notify the Secretary-General of the United Nations (nowadays, in his name, the Executive Director of UNODC) and furnish him with the information of the notification. The Secretary-General shall then transmit such notification and any additional information which he considers relevant, to the parties, to the Commission on Narcotic Drugs and to the WHO (in case the notification was made by a party). The WHO is to find out whether a substance is "liable to similar abuse and productive of similar ill effects" as drugs already scheduled (i.e. opium/morphine/heroin, cocaine and cannabis) or substances that could be converted (with relative ease) into such drugs. The control of the Single Convention may be extended to a substance of any chemical structure whatsoever. The chemical structure of a new substance does not play a role.

Based upon the recommendations made by the WHO the Commission on Narcotic Drugs will decide on whether the substance should be controlled and in which schedule of the Convention it should be placed. Art. 3 §3 (ii) foresees an emergency scheduling procedures: 'provisional application' of control measures as foreseen for Schedule I substances while the Commission on Narcotic Drugs awaits the recommendations of the WHO. The Commission on Narcotic Drugs can make changes in the Schedules of the Single Convention only in accordance with recommendations of the WHO; but it can refuse to make changes recommended by the WHO. The decision by the Commission on Narcotic Drugs, requiring a 2/3 majority (art. 17), is still subject to review by the Economic and Social Council of the United Nations (ECOSOC) upon request of any party.

Source: United Nations, *Commentary on the Single Convention on Narcotic Drugs*, New York 1973.

206 *Commentary on the Single Convention on Narcotic Drugs*, 1961, pp. 76-77.

207 Pietschmann, "A century of international drug control", p. 81.

208 International Narcotics Control Board, list of narcotic drugs under international control ("Yellow List"), 50th ed., December 2011.

209 United Nations Office on Drugs and Crime, *A Century of International Drug Control* (Vienna, 2009), p. 64.

Procedures foreseen to put (new) psychoactive substances under international control under the Convention on Psychotropic Substances of 1971

Article 2 of the Convention on Psychotropic Substances of 1971 foresees that either a party or the World Health Organization (WHO) may recommend putting a substance under control. The Secretary-General has to be notified and the party or WHO has to furnish the information in support of that notification. The Secretary-General shall then transmit such notification and any other information he considers relevant to the parties, to the Commission on Narcotic Drugs and to WHO (in case the notification was made by a party).

The procedures laid down in the 1971 Convention then deviate slightly from those in the Single Convention on Narcotic Drugs of 1961, giving, in theory, greater power to the Commission on Narcotic Drugs in the final decision. Nonetheless, without the active participation of WHO, notably, the elaboration of an assessment, no further scheduling of a new substance can take place (except for a kind of "voluntary" emergency scheduling by the parties, i.e. "provisional application" of control measures as foreseen under Schedule I or II, according to article 2, paragraph 3).

Following the notification from a party to the 1971 Convention (or from the Commission on Narcotic Drugs), a "pre-review" is undertaken by WHO, which may make the recommendation for a "critical review". This "critical review" or assessment by WHO is to provide answers to a number of questions in article 2, paragraph 4, as to whether

(a) ... the substance has the capacity to produce

(i) 1. A state of dependence,

2. Central nervous system stimulation or depression, resulting in hallucinations or disturbances in motor function or thinking or behaviour or perception or mood, or

(ii) Similar abuse and similar ill effects as substances in Schedule I, II, III or IV, and

(b) ... there is sufficient evidence that the substance is being or is likely to be abused so as to constitute public health and social problem warranting the placing of the substance under international control.

WHO must communicate its assessment to the Commission on Narcotic Drugs, providing answers to the questions on "the extent or likelihood of abuse, the degree of seriousness of the public health and social problem and the degree of usefulness of the substance in medical therapy, together with recommendations on control measures, if any, that would be appropriate in the light of its assessment."

The Commission on Narcotic Drugs, taking into account the assessment of WHO, which is "determinative as to medical and scientific matters" (art. 2, para. 5), and bearing in mind the economic, social, legal, administrative and other factors it may consider relevant, will then decide whether or not the specific substance will be controlled and into which schedule it is to be placed. In other words, provided WHO has communicated its findings to the Commission on Narcotic Drugs, the Commission has some discretionary powers to deviate from the WHO recommendations on the basis of economic, social, legal or administrative arguments. Decisions require a two-thirds majority of its total membership (art. 17, para. 2). The Commission on Narcotic Drugs, however, cannot decide to control a substance if WHO has failed to find that it had dangerous properties. Similarly, the Commission cannot put a substance into Schedule I if WHO has found that such a substance would have more than "very limited" therapeutic usefulness (art. 2, para. 4 (a), (i) or (ii)). The decision of the Commission will then be communicated to the parties and the Secretary-General and will become effective 180 days after the date of such communication (art. 2, para. 7).

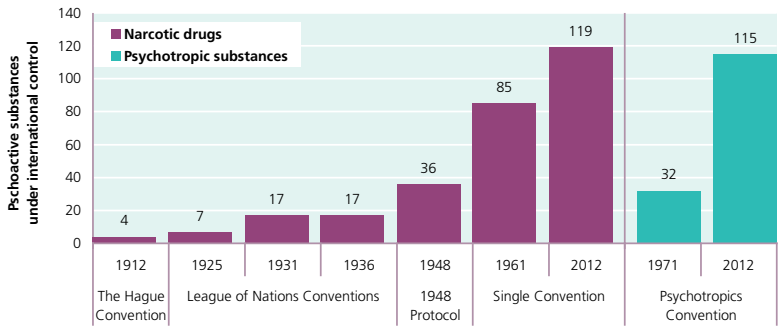
Source: Commentary on the Convention on Psychotropic Substances (United Nations publication, Sales No. E.76.XI.5).

ness against the potential social harm arising from the misuse of a specific substance. The 1971 Convention, like the 1961 Convention, has four schedules. The variation of controls, however, depending on the schedules is more nuanced:

- Schedule I is the strictest control regime, basically prohibiting a substance except for scientific and very limited medical purposes (art. 7).
- Schedule II is reserved for substances that may have a strong potential for abuse but that also have generally recognized therapeutic use. Commercial transactions are allowed, though they are strictly controlled. Manufacturers, wholesale distributors, exporters and importers have to keep records, showing in detail the quantities manufactured, the acquisition and disposal, the date, the supplier and the recipient. Separate import and export authorizations are also required.
- For Schedule III substances, no separate import or export authorizations are needed. Record-keeping requirements are less strict. National authorities have to provide the International Narcotics Control Board only with aggregate information on the quantities manufactured, exported and imported.[210]
- Control under Schedule IV is largely limited to a requirement to have such substances prescribed by medical doctors and to have — like other schedules — the manufacturing, import, export and distribution licensed.

210 United Nations Office on Drugs and Crime, *A Century of International Drug Control*, p. 65.

Fig. 48. Number of substances under international control, 1912-2012



Source: I. Bayer and H. Ghodse, "Evolution of international drug control, 1945-1995", *Bulletin on Narcotics*, vol. LI, Nos. 1 and 2 (1999) (United Nations publication) (for natural drugs until 1995 and synthetic drugs until 1948); *The International Drug Control Conventions* (United Nations publication, Sales No. E.09.XI.20); International Narcotics Control Board, list of narcotic drugs under international control ("Yellow List"), 50th ed., December 2011; International Narcotics Control Board, list of psychotropic substances under international control ("Green List"), 24th ed., May 2010.

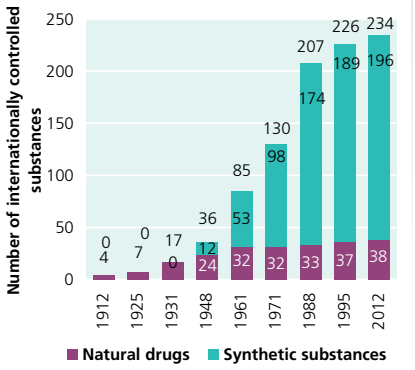
The 1971 Convention placed a number of natural, semi-synthetic and synthetic substances under international control, including central nervous system stimulants (e.g. amphetamine, methamphetamine, methylphenidate, amfepramone), hallucinogens (e.g. LSD, mescaline, psilocybine, dimethyltryptamine (DMT)) and sedative-hypnotics (e.g. barbiturates, methaqualone).[211] It also included THC, the main psychoactive substance of the cannabis plant, and PCP, known as "angel dust", a recreational, dissociative drug causing both hallucinogenic and anaesthetic side effects.

The number of substances controlled under the 1971 Convention has almost quadrupled, from 32 to 115,[212] since its adoption, a far greater increase than reported for substances controlled under the 1961 Convention over the same period. The largest expansion of the 1971 Convention took place in 1984, when 33 benzodiazepines were added to the substances under control. MDMA ("ecstasy") was added to the list of controlled substances in 1986. In the same year, cathine and cathinone, the main psychoactive substances of the khat plant, were also controlled. Buprenorphine, an opioid, was added in 1989. Methcathinone came under control in 1995. GHB and 2C-B, a phenethylamine psychedelic drug, were added to the list of controlled substances in 2001. The latest addition, in 2003, was amineptine, an atypical tricyclic antidepressant.

Most of the NPS discussed in this chapter are synthetic drugs and are closely related to the substances scheduled under the 1971 Convention. Thus, most of the NPS, if controlled at the international level, would probably be controlled under that Convention.

To look at the issue from a different perspective: if the substances under international control are classified as

Fig. 49. Number of substances under international control, 1912-2012, by type

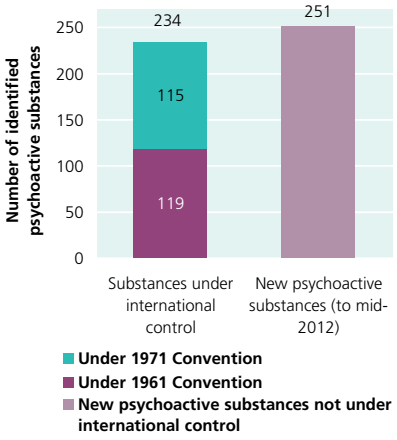


Source: I. Bayer and H. Ghodse, "Evolution of international drug control, 1945-1995", *Bulletin on Narcotics*, vol. LI, Nos. 1 and 2, 1999 (United Nations publication) (for natural drugs until 1995 and for synthetic drugs until 1971); *Multilingual Dictionary of Narcotic Drugs and Psychotropic Substances under International Control* (United Nations publication, Sales No. M.06.XI.16), Part One; International Narcotics Control Board, list of narcotic drugs under international control ("Yellow List"), 50th ed., December 2011; International Narcotics Control Board, list of psychotropic substances under international control ("Green List"), 24th ed., May 2010.

211 B. Rexed and others, *Guidelines for the Control of Narcotic and Psychotropic Substances: In the Context of the International Treaties* (Geneva, World Health Organization, 1984).

212 In some publications the number is given as 116, but that is because tetrahydrocannabinol (THC) and dronabinol (a pharmaceutical formulation of THC) are counted as two different substances.

Fig. 50. Internationally controlled and non-controlled psychoactive substances in 2012



Source: International Narcotics Control Board, list of narcotic drugs under international control ("Yellow List"), 50th ed., December 2011; International Narcotics Control Board, list of psychotropic substances under international control ("Green List"), 24th ed., May 2010; United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances* (Vienna, March 2013).

natural drugs and synthetic substances, irrespective of the convention under which they are scheduled, it becomes obvious that the main increases since the Second World War have been among the synthetic substances. Almost 84 per cent of all substances under control in 2012 were synthetic drugs, up from 33 per cent in 1948. Most of the synthetic drugs are under the 1971 Convention, though it has to be said that currently, most substances controlled under the 1961 Convention are also synthetic substances (mostly synthetic opioids).

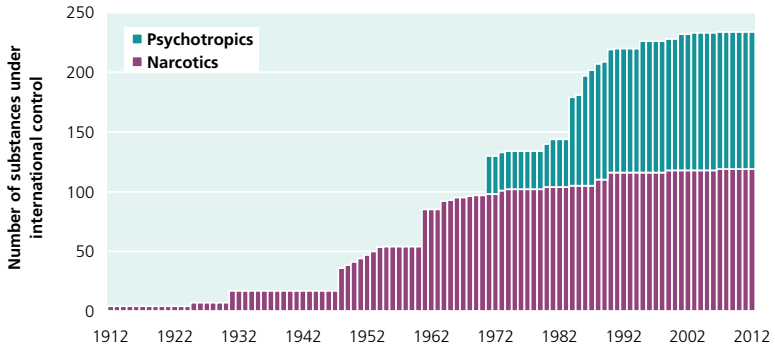
Overall, 234 psychoactive substances (excluding esters and isomers) are currently under the governance of the 1961 Convention and the 1971 Convention.

What is unprecedented, however, has been the accelerating pace at which NPS have been developed and spread around the globe in recent years. UNODC identified the emergence of 251 NPS up to mid-2012 of which the bulk was identified over the 2009 - mid-2012 period.

On the other hand, an analysis of the number of substances controlled also shows that the upward trend in the scheduling of psychoactive substances has largely ground to a halt in recent years, even though the number of NPS emerging in the market is on an upward curve.[213]

The WHO has found it increasingly difficult — partly for financial reasons — to convene meetings of the Expert Committee on Drug Dependence to discuss scheduling

Fig. 51. Number of substances controlled under the international drug conventions, 1912-2012



Source: I. Bayer and H. Ghodse, "Evolution of international drug control, 1945-1995", *Bulletin on Narcotics*, vol. LI, Nos. 1 and 2, 1999 (United Nations publication) (for natural drugs until 1995 and synthetic drugs until 1948); *The International Drug Control Conventions* (United Nations publication, Sales No. E.09.XI.20); International Narcotics Control Board, list of narcotic drugs under international control ("Yellow List"), 50th ed., December 2011; International Narcotics Control Board, list of psychotropic substances under international control ("Green List"), 24th ed., May 2010.

213 It must be taken into consideration, however, that not all NPS are widespread. There are discrepancies in the number of substances detected versus those actually used. Moreover, some of the NPS may not be as problematic as the substances already controlled.

issues in recent years.[214] In addition, ever more concerns were raised by experts at the Expert Committee meetings over the fact that the control of a substance could reduce its availability for medical purposes and research in the future, which reduced the number of positive recommendations for control.[215] Given the large number of emerging NPS, the actual number of new substances proposed for control has thus been extremely limited. The last time a psychotropic substance was scheduled was in 2003. The 35th meeting of the Expert Committee on Drug Dependence, held in June 2012, considered the control of ketamine and recommended against controlling it because it did "not appear to pose a significant global public health risk" while being "widely used as an anaesthetic in developing countries".[216] Substances such as mephedrone or MDPV, which have caused serious health problems in a number of countries in recent years, are yet to undergo a "critical review", and it will be some time before they can become internationally controlled substances.

Irrespective of the apparent shortcomings in the specific cases mentioned above, there are legitimate questions to be raised as to the capacity of Member States — and the associated costs — to control an ever larger number of substances, affecting police, customs, forensic laboratories, import/export authorities, health authorities, etc.

This is also an opportunity for knowledge-sharing and learning from the experiences of individual Member States. In fact, the international drug control system has, from its very inception, drawn on the lessons learned by individual Member States and incorporated their experiences into its own legal framework.

New drugs of abuse at the national and the regional level

Various innovative approaches have been tried by Member States at the national and the regional level. They are worth studying for possible application at the international level.

Early warning system

A number of countries have introduced early warning systems in order "to provide timely information so that policymakers can make evidence-based decisions".[217] The first system at the regional level was introduced in Europe in 1997, the early warning system on the emergence of new synthetic drugs.[218] As of 2005, the system was broadened to include not only synthetic drugs, but all kinds of NPS.[219]

The early warning system builds on the national early warning systems that were created in all European Union member States, as well as in Norway and the two European Union candidate countries Croatia and Turkey. The early warning system has been characterized by EMCDDA as a "low-cost mechanism to share information on new threats, and as a catalyst for action when this has been merited". Its key task remains its function as an alert system on NPS. In order to remain vigilant, the early warning system expanded to include not only forensic science but also a range of health and law enforcement professionals as well as independent researchers.[220]

When a NPS is first detected in a country (based on seizures, undercover purchases, alerts by the health authorities, etc.), detailed information on the manufacture, traffic and use, including supplementary information on possible medical use, is sent by the member State to Europol and to EMCDDA, which communicate it to their respective national units, the European Commission and the European Medicines Agency (EMA).

If Europol and EMCDDA consider that the information merits further action, it is presented in the form of a Europol-EMCDDA joint report and submitted to the Council, the EMA and the Commission. The information contained in the joint report includes:

- A chemical and physical description, including the name under which the NPS is known
- Frequency, circumstances and/or quantities in which a NPS has been encountered
- Means and methods of manufacture of the NPS and the involvement of organized crime in its manufacture or trafficking
- Indications of the health and social risks associated with the NPS, including the characteristics of its users
- Whether the NPS is or has been under assessment by the United Nations system
- Whether the NPS is already subject to control at the national level in a Member State
- Chemical precursors, mode and scope of the expected use of the NPS.

214 Such meetings used to be held every two years, but the time gap has widened in recent years. Following a meeting in 2006, it took six years for the Expert Committee on Drug Dependence to convene again, in June 2012.

215 *WHO Expert Committee on Drug Dependence: Thirty-fifth Report*, WHO Technical Report Series, No. 973 (Geneva, World Health Organization, 2012); *WHO Expert Committee on Drug Dependence: Thirty-fourth Report*, WHO Technical Report Series, No. 942 (Geneva, World Health Organization, 2006); *WHO Expert Committee on Drug Dependence: Thirty-third Report*, WHO Technical Report Series, No. 915 (Geneva, World Health Organization, 2003).

216 *WHO Expert Committee on Drug Dependence: Thirty-fifth Report*, WHO Technical Report Series, No. 973 (Geneva, World Health Organization, 2012).

217 Carolyn Coulson and Jonathan P. Caulkins, "Scheduling of newly emerging drugs: a critical review of decisions over 40 years", *Addiction*, vol. 107, No. 4 (2012), pp. 766-773.

218 Joint action 97/396/JHA of 16 June 1997, adopted by the Council of the European Union on the basis of Article K.3 of the Treaty on European Union, concerning the information exchange, risk assessment and the control of new synthetic drugs (*Official Journal of the European Communities*, L 167, 25 June 1997).

219 Council of the European Union Decision 2005/387/JHA.

220 European Monitoring Centre for Drugs and Drug Addiction, *Early Warning System: National Profiles* (Luxembourg, Office for Official Publications of the European Communities, 2012).

On its part, EMA submits the following information to Europol and EMCDDA:

- Whether the NPS has received a marketing authorization
- Whether it is the subject of an application for a marketing authorization
- Whether a marketing authorization that had been granted has been suspended.

The early warning system forms an integral part of the European Union-wide control system for NPS. In total, six steps[221] are required in the procedures established by the Council Decision for submitting a NPS for control:

1. A member State provides information on a NPS in its market
2. Europol and EMCDDA, in collaboration with EMA, prepare a joint report and submit it to the Council
3. The Council requests a risk assessment from EMCDDA
4. EMCDDA submits the risk assessment to the Council and the Commission
5. The Commission presents an initiative for control measures to the Council
6. The Council decides on the submission of the substance to control measures and on the obligation to introduce criminal law measures.

The early warning system covers the first two steps on the list above towards controlling a NPS. The principles of the scheduling system developed at the European Union level are not so different from those at the international level. The main substantive difference seems to be the existence of the early warning system.

The evaluation of the functioning of Council Decision 2005/387/JHA by the European Commission identified several critical points, notably the length of the process. However, the same assessment also concluded that the early warning system was "a useful tool for alerting member States to new substances detected in neighbouring countries", even though most substances were not subsequently submitted for any risk assessment following the joint reports.[222]

The early warning system prompted risk assessment for MBDB (1999), 4-MTA (1999), GHB (2002), ketamine (2002), PMMA (2003), TMA-2 (2004), 2C-I, 2C-T-2, 2C-T-7 (2004), BZP (2009) and mephedrone (2011).[223] In addition, joint reports from EMCDDA and Europol have been, in recent years, prepared for 4-methylamphetamine (2012) and 5-(2-aminopropyl) indole (2013).[224] As a consequence, some of the most critical NPS, in terms of spread and overall health consequences, are under control in the European Union, including BZP, PMMA (an amphetamine-type stimulant that has caused a number of deaths), several psychedelic phenethylamines (2C-I, 2C-T-2, 2C-T-7), TMA-2 (an analogue of the phenethylamine cactus alkaloid mescaline, often sold as "research chemicals") and mephedrone[225] which appears to have caused some of the most serious NPS-related health problems in recent years.

Emergency scheduling

The traditional approach to drug scheduling tends to be very time-consuming. At the same time, decisions made prematurely before a scientific consensus emerges may be counterproductive.[226] This creates a dilemma. One way to overcome this has been via the introduction of "emergency procedures",[227] an approach taken frequently, which involves dealing with the problem by introducing an emergency scheduling system.

Such systems have been established in Denmark, Germany, the Netherlands, Spain, the United Kingdom, the United States[228] and elsewhere. They allow for the ban of dangerous substances by ministerial decree.[229] The systems in Germany, the Netherlands and the United Kingdom enable the authorities to place a substance under temporary control for a year, with the approval of a minister instead of parliament. If the procedure for permanent control is not established within that year, the restriction lapses.[230]

Emergency scheduling permits quicker action than permanent scheduling and is used when a substance poses imminent danger to public health.[231] At the same time, emergency scheduling systems help to mitigate the risk of making incorrect decisions by delaying the final scheduling decision by, typically, 12 to 18 months. In 2011, the United States temporarily scheduled several synthetic cannabinoids (JWH-018; JWH-073; JWH-200; CP-47,497;

221 European Commission, "Report from the Commission on the assessment of the functioning of Council Decision 2005/387/JHA on information exchange, risk assessment and control of new psychoactive substances", document COM(2001) 430 (Brussels, 11 July 2001), p. 4.

222 Ibid., p. 6.

223 Available from www.emcdda.europa.eu/publications/searchresults?action=list&type=PUBLICATIONS&SERIES_PUB=w12.

224 Available from www.emcdda.europa.eu/publications/searchresults?action=list&type=PUBLICATIONS&SERIES_PUB=a105.

225 European Monitoring Centre for Drugs and Drug Addiction and European Police Office, "EMCDDA- Europol 2011 annual report on the implementation of Council decision 2005/387/JHA".

226 Coulson and Caulkins, "Scheduling of newly emerging drugs: a critical review of decisions over 40 years".

227 *Report of the International Narcotics Control Board for 2012.*

228 Emergency scheduling was first introduced in the United States in 1984 as part of its Comprehensive Crime Control Act of 1984 which in section 508 gave the Attorney General the authority to list a substance temporarily under Schedule I of the Controlled Substances Act (CSA).

229 Jan van Amsterdam, David Nutt and Wim van den Brink, "Generic legislation of new psychoactive drugs", *Journal of Psychopharmacology*, vol. 27, No. 3 (2013), pp. 317-324.

230 European Monitoring Centre for Drugs and Drug Addiction, "Responding to new psychoactive substances".

231 See http://international.drugabuse.gov/meetings/international-forum/executive-summaries/2012-nida-international-forum.

CP-47,497 C8 homologue)[232] and some of the very problematic synthetic cathinones (mephedrone, methylone and MDPV),[233] before putting them under regular control a year later. Emergency scheduling appears to have helped a number of countries to prevent the outbreak of drug epidemics.

The "rapid procedures" or "fast-track systems" established by a number of other countries are different. In such systems, substances are placed under control by shortening defined consultation periods during the law-making process. These accelerated scheduling decisions are then permanent. This may help to protect the population from serious health hazards in case of an emergency. Nonetheless, it carries an inherent risk, in that substances that do not require stringent control are nevertheless placed under it, potentially hampering the development of therapeutic applications.[234]

Emergency scheduling, i.e. the "provisional application" of control measures, is, in principle, also foreseen at the international level in the 1961 Convention, for the period until WHO has made its assessment and, to a lesser extent, in the 1971 Convention. The application of these possibilities could, in theory, reduce by several years the period until substances are controlled at the international level. However, Member States have refrained from making use of this system. The specific formulation of the "provisional application" of control measures in the 1971 Convention may have contributed to this. In contrast to the formulation of the 1961 Convention (art. 3, para. 3 (ii)), which gives the Commission on Narcotic Drugs the right to decide on such provisional applications of control measures, the 1971 Convention only encourages the Parties to "examine in the light of all information available to them, the possibility of the provisional application to the substance of all measures of control applicable to substances in Schedule I or Schedule II, as appropriate" (art. 2, para. 3). In other words, the 1971 Convention provides only for a voluntary, non-binding provisional application of scheduling procedures to be implemented by individual Member States. It does not give the Commission on Narcotic Drugs the power to decide on such measures in a legally binding way. At most, the Commission on Narcotic Drugs could adopt a resolution asking Member States to implement such measures.

Analogue and generic scheduling

Most scheduling systems, including emergency scheduling, tend to be reactive in nature, in that they can start operating only after a substance has been found to pose a severe risk to public health and is already in wide circulation. In order to be proactive, a number of countries have introduced either analogue or generic scheduling systems.[235] The basic idea in both systems is similar. Instead of requiring an expensive and time-consuming scheduling process for each individual substance, modifications of the controlled substance automatically fall under the control system.

By way of illustration, the United States analogue system, the prototype of such systems worldwide, is explained below, and is subsequently compared to the generic scheduling system found in the United Kingdom and a few other countries.

Analogue system

The best known example of an analogue control system can be found in the United States, whose system served as a model for several other analogue systems adopted in the 1980s, including in Canada, New Zealand and partly in Australia.[236]

The American system, dating back to 1985/86,[237] was a response to the proliferation of synthetic derivatives of controlled substances in the early 1980s, such as the spread of fentanyl derivatives, alphaprodine derivatives and various phenethylamines related to MDMA, and amphetamines designed to produce similar effects to those of controlled substances.[238]

Under section 802 (32)(A) of the United States Controlled Substances Act (CSA), a "controlled substance analogue" is defined as a substance:

(a) Whose chemical structure is substantially similar to that of a scheduled substance;

(b) Whose effects (stimulant, depressant, hallucinogenic) are substantially similar to or greater than those of a controlled substance.

Thus, the analogue system anticipates the emergence of NPS and controls them even before they have reached the market. Eventually, a court decides whether a substance

232 United States, Drug Enforcement Administration, "Schedules of controlled substances: temporary placement of five synthetic cannabinoids into Schedule I", Final order, 21 CFR Part 1308, Docket No. DEA-345F (www.deadiversion.usdoj.gov/fed_regs/rules/2011/fr0301.htm).

233 United States, Drug Enforcement Administration, "Schedules of controlled substances: temporary placement of three synthetic cathinones into Schedule I", Final order, 21 CFR Part 1308, Docket No. DEA-357 (www.deadiversion.usdoj.gov/fed_regs/rules/2011/fr1021_3.htm).

234 Coulson and Caulkins, "Scheduling of newly emerging drugs: a critical review of decisions over 40 years".

235 *Report of the International Narcotics Control Board for 2012.*

236 United Nations Office on Drugs and Crime, *The Challenge of New Psychoactive Substances.*

237 United States, *"Controlled Substance Analogs" Enforcement Act of 1985: Report of the Committee on the Judiciary — United States Senate, on S. 1437*; L. A. King and others, "Analogue controls: an imperfect law" (London, United Kingdom Drug Policy Commission, 19 June 2012). Available from www.ukdpc.org.uk/publication/analogue-controls-an-imperfect-law.

238 L. A. King and others, "Analogue controls: an imperfect law" (London, United Kingdom Drug Policy Commission, 19 June 2012). Available from www.ukdpc.org.uk/publication/analogue-controls-an-imperfect-law.

falls under this definition. Courts in the United States have interpreted the law to mean that both requirements, i.e. similarity in structure and in effects, must be fulfilled.[239] Like traditional scheduling systems, the United States analogue system thus still relies on a substance-by-substance analysis. The analogue system was intended to discourage attempts to skirt the law through molecular tinkering,[240] and it is believed to have reduced the proliferation of new synthetic drugs.

Nonetheless, the implementation of the analogue system has its own set of problems.[241] From the beginning, there have been issues related to the clarity of the statutory definition. The issues related to "similarity" are not always clear-cut.[242] A court judgement is required. In this context, it has been argued that a retrospective process undermines the right of a defendant to know from the outset whether or not an offence has been committed. This led to a court case in which the law on the analogue system was upheld.[243] Nonetheless, the question as to whether a substance is "substantially similar" has repeatedly led to experts butting heads. The situation has been aggravated by the fact that no United States court has ever issued detailed guidelines to establish the criteria to be applied.[244]

Generic system

Generic control systems go a step further. They start from a core molecular structure. The law then specifies variations of the structure of this substance (defining, for instance, particular substituent groups in specific positions in the molecule), which would lead to the automatic control of such substances under the national legislation. In contrast to the analogue system, where all new substances are judged by their similarity to existing substances under control and are eventually dealt with individually (by the court), generic scheduling means that entire chemical families of substances are controlled, i.e. many new substances related to one core molecule. It is not required that the psychoactive effects of the analogues controlled be similar to those of the core molecule.

Generic legislation on drug scheduling exists in the United Kingdom[245] and, to some extent, in Australia.[246] "Generic-like" legislation has recently been introduced to cope with the problem of NPS in Austria, Belgium, Bulgaria, Cyprus, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Norway and Poland.[247]

This approach has been around for a while — for instance, the application of generic definitions in the United Kingdom legislation dates back to 1971,[248] even though most generic definitions in the Drug Misuse Act were introduced after 1976, covering, inter alia, barbiturates, cathinones, fentanyls, pethidines, phenethylamines, phenyl- and benzylpiperazines, synthetic cannabinoid agonists (cannabimimetics) and tryptamines.[249]

A preliminary stage of the concept of generic scheduling has already been reached at the international level. All isomers, esters, ethers and salts of the controlled drugs in Schedule I of the 1961 Convention, unless specifically excluded, are also under international control, as well as isomers of drugs controlled in Schedule II.[250] Similarly, all salts of the psychoactive substances in Schedules I, II, III and IV of the 1971 Convention and stereoisomers, unless specifically excepted, of substances in Schedule I, whenever the existence of such stereoisomers is possible within the specific chemical designation, are automatically under international control.[251]

On the surface, a generic scheduling system is extremely appealing. It is anticipatory instead of reactive. Its main advantage is that it is in line with the precautionary principle and protects public health, because fewer people will be exposed to harmful substances.[252] It also eliminates the scheduling-related costs for national authorities.

On the downside, clandestine chemists may still be able to identify substances falling outside the defined cluster that mimic the effects of controlled substances.[253]

A common feature of generic definitions is that individually controlled substances are not mentioned explicitly. (This also applies to the analogue approach.) Thus, in many of the national drug laws based on a generic definition, one may search in vain for specific substances such as MDMA or mephedrone even though those substances are controlled under such laws. Though the definitions

239 King and others, "Analogue controls: an imperfect law", p. 2.

240 United States, *"Controlled Substance Analogs" Enforcement Act of 1985: Report of the Committee on the Judiciary — United States Senate, on S. 1437*, p. 5.

241 G. Kau, "Flashback to the Federal Analogue Act of 1986: mixing rules and standards in the cauldron", *University of Pennsylvania Law Review*, vol. 156, No. 4 (2008), pp. 1077-1115.

242 Alexander Shulgin, "How similar is substantially similar?", *Journal of Forensic Sciences*, vol. 35, 1990, pp. 8-10.

243 United States Court of Appeals, *United States of America v. Allen McKinney*, 1995 (http://law.justia.com/cases/federal/appellate-courts/F3/79/105/555999/).

244 King and others, "Analogue controls: an imperfect law", p. 2.

245 European Monitoring Centre for Drugs and Drug Addiction, "Responding to new psychoactive substances".

246 Section 314.1 of the Australian Criminal Code Act 1995 gives a detailed chemical definition of what analogue substances are in relation to the substances explicitly controlled, stating that such substances are automatically also controlled, thus introducing de facto a generic drug control concept for Australia.

247 Van Amsterdam, Nutt and van den Brink, "Generic legislation of new psychoactive drugs".

248 The United Kingdom Misuse of Drugs Act 1971 included N-alkyl derivatives of lysergamide (substances closely related to lysergide (LSD)) and cannabinols (including THC).

249 King and others, "Analogue controls: an imperfect law", p. 3.

250 Single Convention on Narcotic Drugs of 1961 as amended by the 1972 Protocol (United Nations, *Treaty Series*, vol. 976, No. 14152).

251 Convention on Psychotropic Substances of 1971 (United Nations, *Treaty Series*, vol. 1019, No. 14956).

252 Van Amsterdam, Nutt and van den Brink, "Generic legislation of new psychoactive drugs".

253 Ibid.

used are largely precise, they may be unintelligible to all but organic chemists.[254] This creates a problem for the public at large. If a law is not well understood, there is a risk that it will not be well implemented. In fact, a number of examples in the present report, suggest that the use of a NPS, even though falling within a generic definition, declines only after it has been explicitly put on a list of controlled substances (e.g. the decline of the use of mephedrone in Australia following its listing in the drug laws, or in the United Kingdom following an explicit import ban).

Also, most of the "legal highs" in Europe were identified in the United Kingdom, even though some of those substances were, officially, already under generic control there, perhaps indicating that many (often foreign) manufacturers and consumers were not aware that they were illegal substances. In short, even in a generic control system, there is a need to identify new substances emerging on the market and to inform the general public and the various stakeholders (police, customs, etc.) that they are already controlled.

An additional technical problem is that related substances may have very different pharmacological properties, and that some may well have therapeutic uses. Even though "control" is not equivalent to "prohibition", it is sometimes feared that a generic form of legislation could hinder the development of new medications.[255] When this was known ex ante, the United Kingdom authorities, for instance, did not exercise generic control and continued to list the substances to be controlled individually.

There exists another potential problem. The legal systems of a number of countries are based on the concept — as part of the principle of legality — that any offence must be clearly defined. This principle is enshrined in some national constitutions as well as in the European Convention on Human Rights. This may pose problems both for generic control systems and, even more so, for analogue control systems. It must be noted, though, that European Court of Human Rights case law allows for some broader interpretations, and thus permits generic definitions as found in the drug laws of Ireland and the United Kingdom.[256]

Application of medicines legislation

A number of countries, faced with the rapid emergence of new substances, have also taken recourse to their national laws on medicines. European countries can base this approach on European Medicines Directive 2001/83/EC, which is intended to ensure that medicinal products are sold and delivered in the member States only with proper authorization. Application of that Directive allows a ban on unauthorized importation, trading and distribution.[257]

An example of a country that followed this approach is Austria, applying the country's medicine legislation (*Arzneimittelgesetz*)[258] to fight the (legal) distribution of Spice and similar products containing synthetic cannabinoids soon after they had emerged in "head shops" in the local market. In late 2008 Austrian authorities temporarily classified Spice products, using a generic definition (herbal mixtures containing synthetic cannabinoids) as "medicinal products" under the country's (non-criminal) medicines legislation before classifying them more permanently under this act in 2009 (prior to a subsequent reclassification of such substances under an act on NPS in 2012).

The Austrian Medicinal Products Act allows for the classification of substances that have the capability to influence the functions of the body or mental conditions. Once Spice products had been established as medicines, paragraph 3 (1) of the Act was applied, which states that it is forbidden to market medicines that, on the basis of current scientific knowledge and practical experiences, have not been proved not to have harmful effects beyond acceptable levels. Any importer of medicinal products must first obtain an authorization to purchase such substances. In case of violation, the importers and sellers face administrative fines and the confiscation of merchandise. The Act allows for temporary confiscations if (a) there are suspicions that such substances are being marketed against the rules and regulations of the Act, or if (b) there is a health danger related to the consumption of such products. Both conditions applied to Spice.

The advantage of the application of the Medicinal Products Act for the drug authorities has been that the importers and distributors, and not the authorities, had to prove that the substances served a legitimate legal purpose and were not harmful. In contrast to the narcotics law, the users were not directly affected by the Act. Consumption or possession for personal use did not entail any penalties.

The approach of dealing with the problem of NPS via the medicinal law proved effective in bringing the open marketing and distribution of Spice products in the country to a quick halt. Though Austria was among the first countries in Europe to have been affected by a Spice epidemic, the 2011 Eurobarometer survey confirmed that its overall prevalence of NPS use was clearly below the European Union average (25 per cent less).[259]

However, the authorities also became aware of the limitation of this approach, prompting them to create a proper act on NPS, which became effective in 2012.

254 King and others, "Analogue controls: an imperfect law", p. 3.

255 Van Amsterdam, Nutt and van den Brink, "Generic legislation of new psychoactive drugs".

256 European Monitoring Centre for Drugs and Drug Addiction, "Responding to new psychoactive substances".

257 Van Amsterdam, Nutt and van den Brink, "Generic legislation of new psychoactive drugs".

258 Austria, Bundesgesetz vom 2. März 1983 über die Herstellung und das Inverkehrbringen von Arzneimitteln (Arzneimittelgesetz — AMG) (Medicinal Products Act), Federal Law Gazette No. 185/1983.

259 Gallup Organization, *Youth Attitudes on Drugs: Analytical Report*.

Nonetheless, this remains an interesting approach for the large number of NPS, which rapidly change their actual compositions and for which the traditional scheduling approach may be too tedious and time-consuming. In fact, EMCDDA encouraged other countries to consider applying the harmonized European Union definition of a medicinal product to NPS so that the respective national medicine agencies could prohibit the unauthorized importation, marketing and distribution of such products.[260]

Application of consumer protection laws

Another approach adopted by a number of countries has been to apply various existing consumer protection laws to fight the flow of NPS into the local market.[261]

For instance, under the European product safety directive, producers are obliged to put only safe products on the market. The directive states that under reasonably foreseeable conditions of use, a product should not "present any risk or only the minimum risks compatible with the product's use, considered to be acceptable and consistent with a high level of protection for the safety and health of persons", taking into account its characteristics, the labelling, any warnings and instructions for its use. Under the directive, distributors must also inform the competent authorities of serious risks and the distributors' actions for prevention. Offences can be punishable by imprisonment.[262]

In this context, Sweden created a separate law on goods that are dangerous to health. The law allows for the rapid classification of a substance in order to make its sale and possession subject to serious criminal penalties. This gives the authorities time to consider whether the specific substance meets the definition of a "drug" and should be scheduled under the law governing narcotics or psychotropic substances in the country.[263]

A number of countries have applied at least parts of their consumer protection legislation to NPS. Italy, for instance, made use of its labelling regulations requiring that goods or food on sale be clearly and accurately labelled in relation to their expected use. Italian authorities invoked this law to confiscate Spice products for not having been properly labelled in the Italian language.[264]

Some countries have also started to apply their anti-fraud legislation. In Austria, e.g., piperazines used to be marketed as "ecstasy". Though piperazines did not fall under the narcotics and psychotropics law as of the mid-2000s, they were seized and the providers were convicted of consumer fraud.

260 European Monitoring Centre for Drugs and Drug Addiction, "Responding to new psychoactive substances".

261 *Report of the International Narcotics Control Board for 2012.*

262 European Monitoring Centre for Drugs and Drug Addiction, *Annual Report 2011: The State of the Drugs Problem in Europe*, p. 96.

263 European Monitoring Centre for Drugs and Drug Addiction, "Responding to new psychoactive substances".

264 Ibid.

Specific legislation on new psychoactive substances

Given the complexities related to their regulation, a few countries have started to implement specific legislation on NPS.

Ireland, the country faced with Europe's highest rates of prevalence for NPS, introduced legislation in 2010 that prohibits the import, export and sale of any addictive or harmful psychoactive substance for human consumption. The maximum penalty for violating the Psychoactive Substances Act[265] is a prison sentence of up to five years. Initial results seem encouraging. The upward trend in the use of NPS could well be halted.

Poland, Europe's second largest market for NPS, prohibited the marketing of "substitute drugs" (i.e. NPS) in 2010.[266] The relevant act introduced a general ban on manufacturing such substitute substances, on introducing them to trade and on advertising them. In the event of a reasonable suspicion that a product might be dangerous, it provides for the health inspector to withdraw such products from the market for a period of up to 18 months to study their harmfulness.[267] Initial results, as discussed in this chapter, look promising.

A similar approach was also chosen by Austria, which was among the first countries to pass a comprehensive law, the New Psychoactive Substances Act,[268] which entered into force in 2012. This Act follows the European Union definition of NPS and applies to all NPS, except those that are already regulated under the Medicinal Products Act. It empowers the Minister of Health to issue a *Verordnung* (directive) to establish various chemical families of psychoactive substances to be controlled, making use of broad generic definitions wherever deemed appropriate. NPS must be confiscated unless the owner can establish that the substance was not intended to be used for its psychoactive effects. The new Psychoactive Substances Act also foresees extensive monitoring of the market and an evaluation of the associated risks of NPS. Offenders who produce, import, export or provide other persons with NPS for their psychoactive properties will have to reckon with a prison sentence of up to two years, and in case of substance-related deaths, of up to 10 years. The Act shares similarities with the Narcotic Substances Act, except for the generic scheduling possibilities and overall lower penalties.[269] Unlike

265 Available from www.irishstatutebook.ie/pdf/2010/en.act.2010.0022.PDF.

266 European Monitoring Centre for Drugs and Drug Addiction, "Responding to new psychoactive substances".

267 Artur Malczewski and others, *2010 National Report (2009 Data) to the EMCDDA by the Reitox National Focal Point: Poland*.

268 Austria, Federal Act on the Protection against Health Hazards in connection with New Psychoactive Substances (New Psychoactive Substances Act), Federal Law Gazette No. 146/2011.

269 Narcotic Substances Act: up to 5 years for traffickers, up to 20 years for traffickers with a leading position in organized crime (Austria, Bundesgesetz über Suchtgifte, psychotrope Stoffe und Drogenausgangsstoffe, Federal Law Gazette No. 112/1997).

the case of the Narcotic Substances Act, consumers of NPS do not face any penalties.

Another specific approach to NPS is evolving in New Zealand. Its Misuse of Drugs Act 1975 used to have three schedules: class A for "very high risk" substances, class B for "high risk" substances and class C for substances with a "moderate risk" of harm. The analogue provisions of the Act state that substances with molecules structurally similar to those of controlled drugs are analogues of those drugs and are automatically considered class C drugs. Nonetheless, the use of NPS increased. In 2005, New Zealand created an additional schedule for new, low-risk psychotropic drugs and put BZP under this schedule. Substances under this schedule pose "less than a moderate risk of harm", and "regulated sale" is foreseen.[270] Regulations refer to dosage, labelling, quality control, manufacturing standards, age limits and restrictions on advertising, i.e. how the products can be marketed.[271] Given the ongoing spread of BZP in New Zealand to the highest levels worldwide and related negative health consequences, BZP was re-rescheduled in 2008 as a class C drug. Subsequently, BZP use declined significantly.

But this did not solve the overall NPS problem, prompting the authorities to introduce new emergency scheduling provisions in 2011.

Those measures, however, were considered insufficient to deal with the problems related to low-risk psychoactive substances.[272] Thus, the Government agreed on the development of new legislation in August 2012, which was submitted to parliament in February 2013 (Psychoactive Substances Bill) and is expected to enter into force in August 2013. This will, in general, require psychoactive products to be approved by a national regulator (to be placed in the Ministry of Health) before they can be legally marketed, somewhat similar to the systems in place for food, alcohol, medicines and hazardous substances. The "sponsors" of psychoactive substances (manufacturers, importers, etc.) will have to demonstrate that the products do not pose an undue risk of harm. The onus of proof is thus with the sellers of such products, not with the authorities. The legislation also foresees measures to prevent attempts to market psychoactive products as incense or plant foods in order to skirt the regulations. Breaches of the rules will be subject to fines of up to $500,000 or imprisonment of up to two years. The unlawful personal possession of such substances will entail the payment of an infringement fee of up to $500.[273]

270 "Regulatory impact statement: new regulatory regime for psychoactive substances" (October 2012). Available from www.health.govt.nz/about-ministry/legislation-and-regulation/regulatory-impact-statements/new-regulatory-regime-psychoactive-substances.

271 Matt Bowden and Paul Trevorrow, "BZP and New Zealand's alternative approach to prohibition", *Drug Testing and Analysis*, vol. 3, Nos. 7-8 (2011), pp. 426-427.

272 New Zealand, Ministry of Health, "Regulatory impact statement: new regulatory regime for psychoactive substances".

273 New Zealand, Psychoactive Substances Bill, Bill No. 100-1. Available from www.legislation.govt.nz/bill/government/2013/0100/6.0/whole.html#DLM5042921.

D. CONCLUSIONS AND FUTURE COURSE OF ACTION

NPS have been defined by UNODC as substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Convention or the 1971 Convention, but that may pose a public health threat. Both psychoactive synthetic drugs and psychoactive plant-based substances thus constitute NPS. The use of the term "new" does not refer to the time when a substance was first identified or synthesized, but to when it emerged in the global market for recreational use.

The information and findings contained in the present chapter allow a number of conclusions to be drawn:

1. The emergence of NPS on the drug scene is not per se a new phenomenon. In fact, starting from just four substances controlled in the 1912 Convention, the number increased to 85 at the time of the 1961 Convention, to 130 at the time of the 1971 Convention and to 234 by 2012. The emergence of new substances in the drug markets has clearly gained pace over the last decade: 251 NPS had been identified by Member States as of mid-2012.
2. There has been not only an increase in the number of NPS on the market but — in contrast to illicit drugs — an overall increase in their use over the last decade. Thus, a "free market" for NPS (as also for drugs in general) is most probably not the right approach. The present report has shown, in general, that countries that introduced controls could count on a decline in the prevalence rates of the specific NPS concerned. In a number of cases, however, the overall problem of NPS was not solved, as other, non-controlled products replaced those substances.
3. The emergence of NPS is becoming a global phenomenon: 88 per cent of the 80 countries that replied to the UNODC questionnaire in 2012 had identified NPS on their market. The regional percentage ranged from 100 per cent in the Oceania region (based on 2 countries) to 70 per cent in Africa (based on 10 countries). The largest number of countries reporting NPS were in Europe (31), followed by Asia (19) and the Americas (11).
4. The market for NPS is extremely dynamic. Prior to 2008, most countries reported ketamine, followed by piperazines and non-controlled phenethylamines as NPS. Over the period 2008-2012, in contrast, most countries identified synthetic cannabinoids (as contained in Spice products), followed by synthetic cathinones (as contained in "bath salts"). An analysis of Internet search terms revealed similar findings. The list of NPS was topped by Spice, followed by "bath salts", khat and ketamine. Similarly, searches for cannabinoids were more common than for synthetic cathinones or other groups of NPS.

5. The NPS include a huge number of substances (251 at the global level until mid-2012). About a quarter of all identified NPS were synthetic cannabinoids, one fifth were phenethylamines, one sixth were synthetic cathinones and one tenth were non-controlled tryptamines. The most frequently reported NPS (more than 50 times) were JWH-018 and JWH-073 among the synthetic cannabinoids; mephedrone, MDPV and methylone among the synthetic cathinones; and *m*CPP, BZP and TFMPP among the piperazines.
6. There are regional particularities. Most of the NPS appear to have been identified in Europe over the last decade. This may have been a result of the early warning system introduced among European Union countries (plus Croatia, Norway and Turkey) as of the late 1990s. In 2012, however, the total number of newly identified NPS in the United States (158) turned out to be twice as many as in the European Union (73). The prevalence rates of NPS currently appear to be highest in North America, notably in the United States, ahead of Europe, where the single largest NPS market appears to be the United Kingdom. Close to 5 per cent of the population aged 15 to 24 experimented with NPS in the European Union, equivalent to about one fifth of those using cannabis or half of those using illicit drugs other than cannabis. The prevalence rates of the use of NPS in the United States appear to be more than twice as high as in the European Union.

   Synthetic cannabinoid products currently dominate the NPS market in most countries where actual prevalence data are available, including in Germany, Latvia, Poland and the United States and several other countries. Mephedrone appears to be the most widespread NPS in Hungary and the United Kingdom. BZP was the most widespread NPS in New Zealand, where it was marketed for a long time as a legal alternative to or substitute for methamphetamine. Ketamine tops the list of NPS in several countries of South-East Asia, and it has also been reported by countries in the Oceania region, the Near and Middle East, the Americas and Europe. Almost 95 per cent of global ketamine seizures took place in Asia over the last decade. Plant-based NPS are most widespread in the countries of origin, e.g. kratom in Thailand and khat in Yemen and several countries around the Horn of Africa. Synthetic NPS in Africa appear to be most used in some of the more developed countries of the continent, such as South Africa and Egypt.
7. Production of NPS appears to be rather concentrated. A number of source countries for NPS were reported, mostly located in East Asia and, to a lesser extent, in South Asia and Europe. More than half of the countries reporting NPS identified countries in Asia (56 per cent) as their primary source, followed by Europe (28 per cent) and the Americas (9 per cent).
8. The NPS trade is often associated with new media. The Internet seems to play a major role: 88 per cent of the countries with a domestic NPS market indicated that the Internet played a key role in supplying them NPS to the domestic market. Nonetheless, the individual consumers (as reflected in European Union survey data for 2011) purchased NPS primarily at a party or club (36 per cent) or bought them in a specialized shop (33 per cent). Only 7 per cent bought them over the Internet. Physical shipments of NPS to individual countries are mostly by air or by mail.
9. Large data gaps were identified, notably with regard to routinely measured prevalence data, both among students and among the general population. If countries wish to take the issue of NPS seriously, there is clearly a need to improve the data on which decision-making is based.
10. There are some legitimate questions to be raised as to the capacity of Member States to control an ever larger number of substances, affecting police, customs, forensic laboratories, import and export authorities, health authorities, etc.
11. The de facto stalemate of new controls at the international level prompted a number of countries to introduce new, innovative approaches at the national level, in line with article 23 of the 1971 Convention, allowing for stricter, and thus also more encompassing controls than provided for by the Convention to protect public health and welfare. This ranged from the establishment of early warning systems for NPS, to emergency scheduling, analogue scheduling, generic scheduling, application of laws governing medicines and consumer protection to the drafting of specific legislation on NPS, either prohibiting their production and marketing or, in principle, permitting them only when a market regulator had investigated their health consequences and issued a licence. While all of these approaches have pros and cons, they are all valuable experiments.
12. The review of the approaches taken indicates that there may be a need for a global early warning system in order to inform Member States about emerging substances on the market, notably in their neighbouring countries, and help to establish priorities for scheduling decisions.[274]
13. It has also become obvious that the traditional system of scheduling an ever larger number of substances is a time-consuming and expensive exercise, especially as the onus of proof lies with the authorities. Several of the alternative systems introduced by Member States attempt to remedy this situation, and most appear to have improved it. This is reflected in falling NPS prevalence rates after the introduction of such controls.
14. The reduction in the use of specific substances due to control measures is not necessarily proof of success as long as new substances emerge and supply and demand shift to such NPS. This risk must be kept in

274 In fact, in resolution 56/4, adopted by the Commission on Narcotic Drugs at its fifty-sixth session, in March 2013, UNODC was urged to develop a programme for national forensic and/or drug-testing laboratories to enable timely and comprehensive sharing of information on NPS, with a view to providing a global reference point and early warning advisory on NPS.

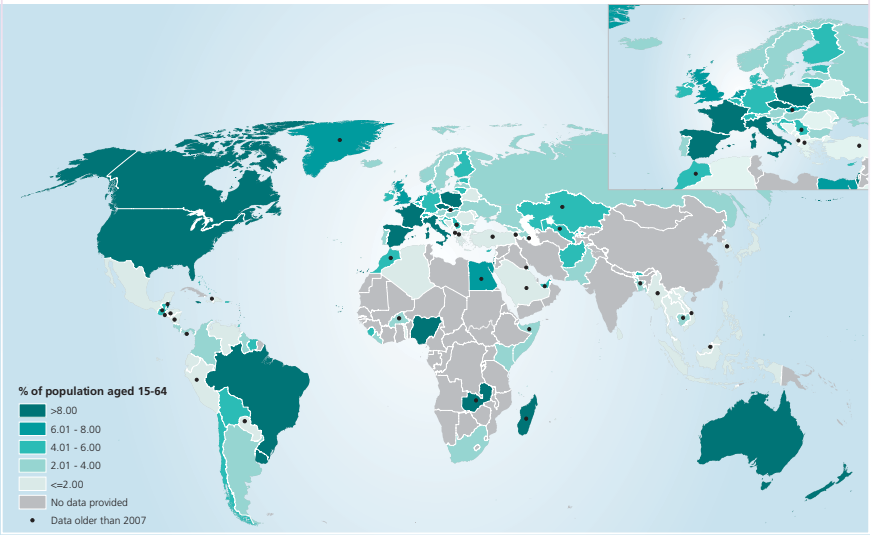
mind when considering various options to respond to the problem of NPS.

15. The current phase of innovative approaches is helpful for the study of the impact of the various control measures. At the same time, there should be no doubt that in the long run, some form of common approach at the international level would be desirable. The approaches taken by individual Member States to deal with NPS appear to have helped them to reduce their problem. But this has also contributed to the creation of a multitude of separate control regimes, differing from region to region, from country to country and sometimes even within countries. All of this has left many loopholes in the control system at the global level, which are regularly being exploited by drug dealers worldwide.

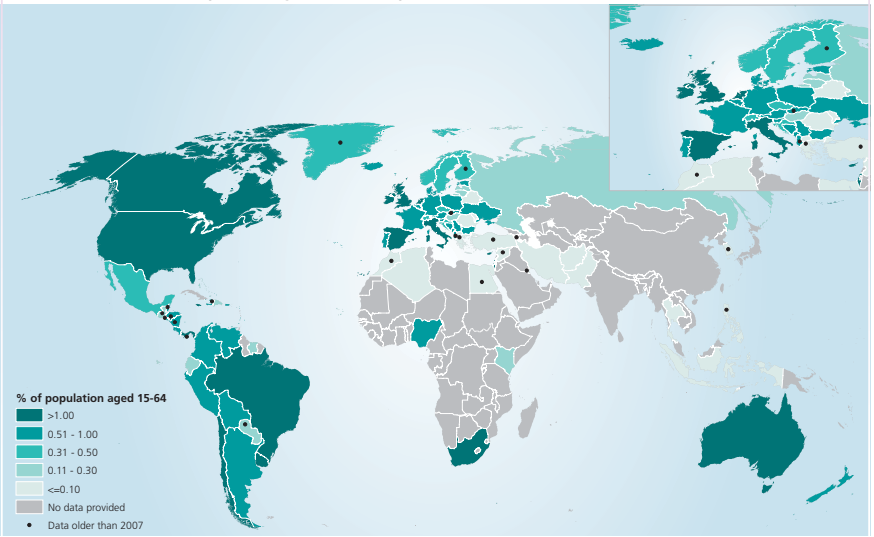
16. Whether the time has already come to adapt the international drug control system in order to better incorporate the NPS problematic is not clear, as several of the new national approaches have been established fairly recently. Thus, serious evaluations of their outcome are yet to be made. Nonetheless, a process could still be started to systematically review, with the help of national experts, the outcome of the various systems and to study and explore, in more detail, the lessons learned, with a view to improving the control system at the international level.

ANNEX I
MAPS AND TABLES ON DRUG DEMAND

Use of cannabis in 2011 (or latest year available)



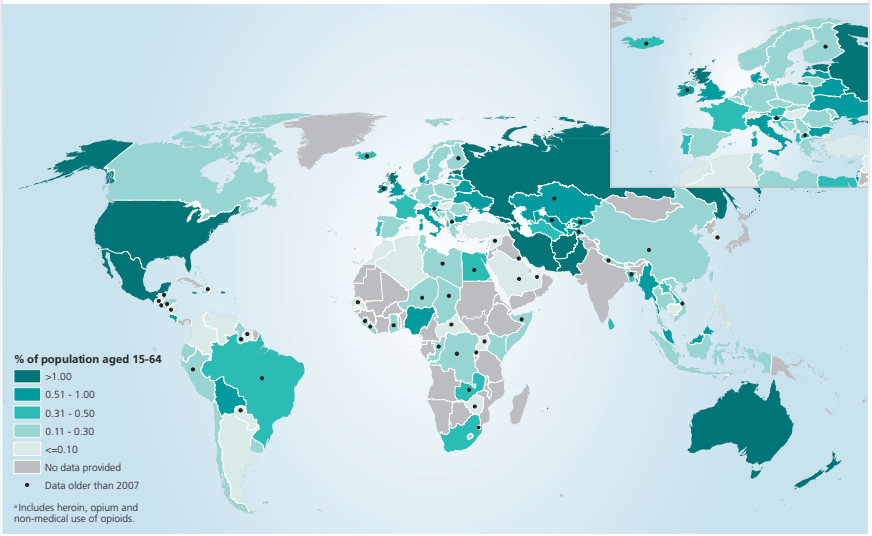
Use of cocaine in 2011 (or latest year available)



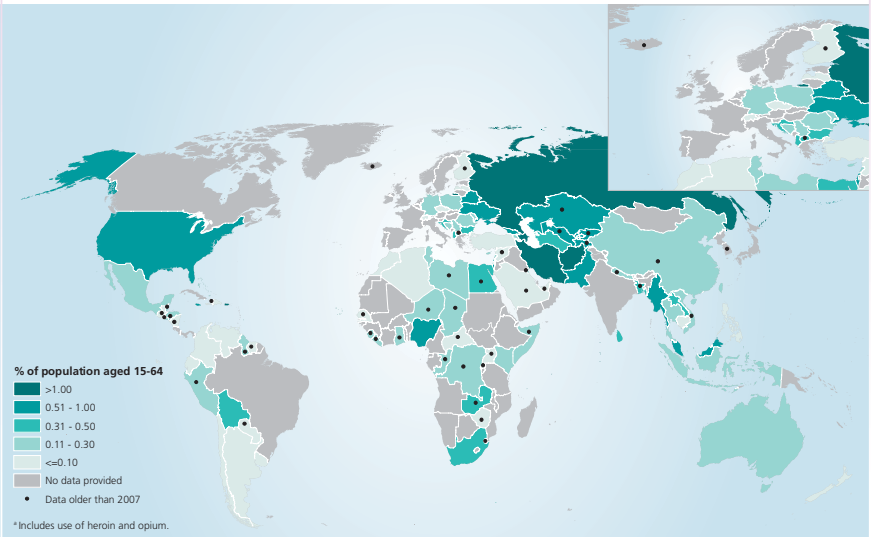
Source (map 1 and 2): UNODC estimates based on annual report questionnaire data and other official sources.

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined.

Use of opioids[a] in 2011 (or latest year available)



Annual prevalence of opiates[a] in 2011 (or latest year available)

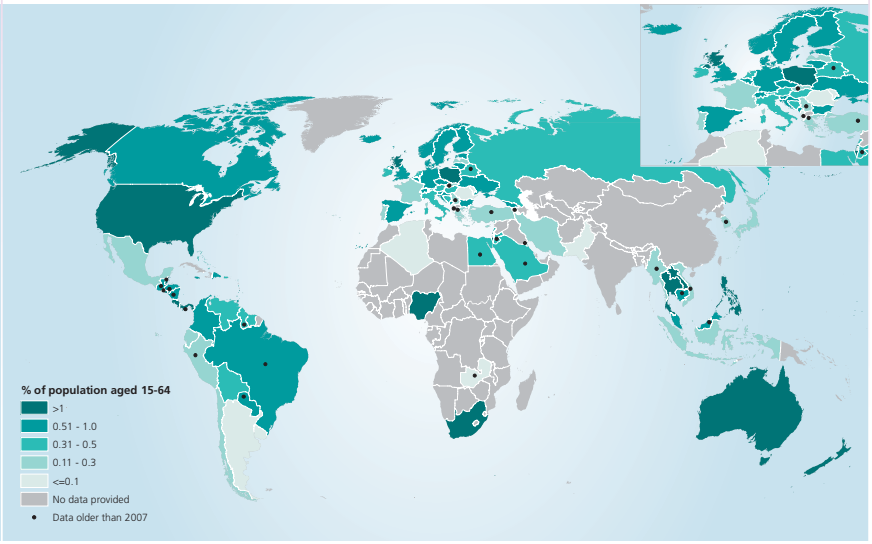


Source (map 3 and 4): UNODC estimates based on annual report questionnaire data and other official sources

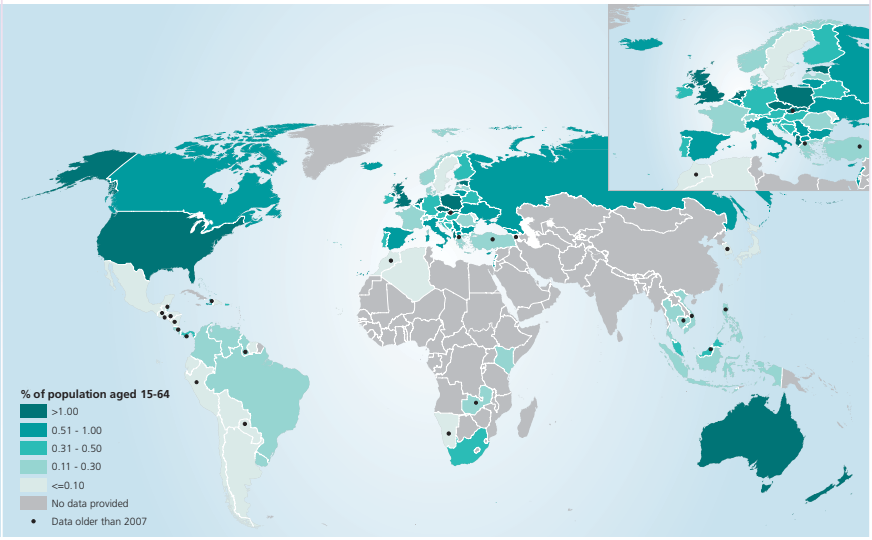
Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined.

According to the Government of Canada, data on heroin use based on the household survey is not reportable and the Government of Canada does not report an estimate based on indirect methods.

Use of amphetamines in 2011 (or latest year available)



Use of "ecstasy" in 2011 (or latest year available)



Source (map 5 and 6): UNODC estimates based on annual report questionnaire data and other official sources

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined.

Annual prevalence of the use of cannabis, opioids and opiates, by region

Region or subregion	Cannabis						Opioids						Opiates					
	Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)		
	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper
Africa	**43,930**	**19,510**	**57,350**	**7.5**	**3.3**	**9.7**	**1,920**	**960**	**2,920**	**0.33**	**0.16**	**0.50**	**1,820**	**910**	**2,270**	**0.3**	**0.2**	**0.4**
East Africa	5,940	1,980	10,190	4.1	1.4	7.1	240	170	880	0.17	0.12	0.61	220	160	300	0.2	0.1	0.2
North Africa	5,920	2,920	9,190	4.4	2.2	6.8	340	130	560	0.25	0.10	0.41	340	130	560	0.3	0.1	0.4
Southern Africa	4,090	2,860	7,470	5.0	3.5	9.1	330	220	350	0.41	0.27	0.43	280	190	300	0.3	0.2	0.4
West and Central Africa	27,990	11,750	30,500	12.4	5.2	13.5	1,000	440	1,130	0.44	0.19	0.50	980	420	1,120	0.4	0.2	0.5
Americas	**49,060**	**48,420**	**50,640**	**7.9**	**7.8**	**8.1**	**13,020**	**12,810**	**13,290**	**2.1**	**2.1**	**2.1**	**1,600**	**1,410**	**1,770**	**0.3**	**0.2**	**0.3**
Caribbean	760	460	1,990	2.8	1.7	7.3	100	60	190	0.4	0.2	0.7	80	50	160	0.3	0.2	0.6
Central America	660	640	700	2.6	2.5	2.7	40	40	50	0.2	0.1	0.2	20	20	20	0.1	0.1	0.1
North America	32,700	32,520	32,890	10.7	10.6	10.7	12,060	11,920	12,200	3.9	3.9	4.0	1,400	1,250	1,460	0.5	0.4	0.5
South America	14,940	14,810	15,060	5.7	5.6	5.7	820	790	860	0.3	0.3	0.3	110	90	120	0.04	0.03	0.05
Asia	**54,070**	**28,810**	**87,110**	**1.9**	**1.0**	**3.1**	**12,190**	**9,350**	**15,260**	**0.4**	**0.3**	**0.5**	**10,020**	**7,660**	**12,860**	**0.4**	**0.3**	**0.5**
Central Asia	2,070	1,830	2,160	3.9	3.5	4.1	470	450	490	0.9	0.9	0.9	430	410	450	0.8	0.8	0.8
East and South-East Asia	9,790	5,770	22,730	0.6	0.4	1.5	3,710	2,880	5,030	0.2	0.2	0.3	3,660	2,800	4,970	0.2	0.2	0.3
Near and Middle East	9,180	5,110	13,220	3.4	1.9	5.0	5,140	3,860	6,160	1.9	1.4	2.3	3,180	2,310	4,070	1.2	0.9	1.5
South Asia	33,030	16,100	49,010	3.5	1.7	5.2	2,870	2,150	3,590	0.3	0.2	0.4	2,750	2,130	3,380	0.3	0.2	0.4
Europe	**30,920**	**30,140**	**31,710**	**5.6**	**5.4**	**5.7**	**4,040**	**3,970**	**4,100**	**0.7**	**0.7**	**0.7**	**3,010**	**2,940**	**3,070**	**0.5**	**0.5**	**0.6**
Eastern and South-Eastern Europe	6,240	5,520	6,970	2.7	2.4	3.0	2,800	2,790	2,810	1.2	1.2	1.2	1,890	1,880	1,900	0.8	0.8	0.8
Western and Central Europe	24,680	24,610	24,750	7.6	7.6	7.6	1,230	1,180	1,290	0.4	0.4	0.4	1,120	1,060	1,170	0.3	0.3	0.4
Oceania	**2,630**	**2,210**	**3,500**	**10.9**	**9.1**	**14.5**	**730**	**550**	**820**	**3.0**	**2.3**	**3.4**	**40**	**40**	**60**	**0.2**	**0.2**	**0.2**
Global estimate	**180,620**	**129,100**	**230,320**	**3.9**	**2.8**	**5.0**	**31,900**	**27,650**	**36,390**	**0.7**	**0.6**	**0.8**	**16,490**	**12,960**	**20,030**	**0.4**	**0.3**	**0.4**

Source: UNODC estimates based on annual report questionnaire data and other official sources.

Annual prevalence of the use of cocaine, amphetamines and "ecstasy", by region

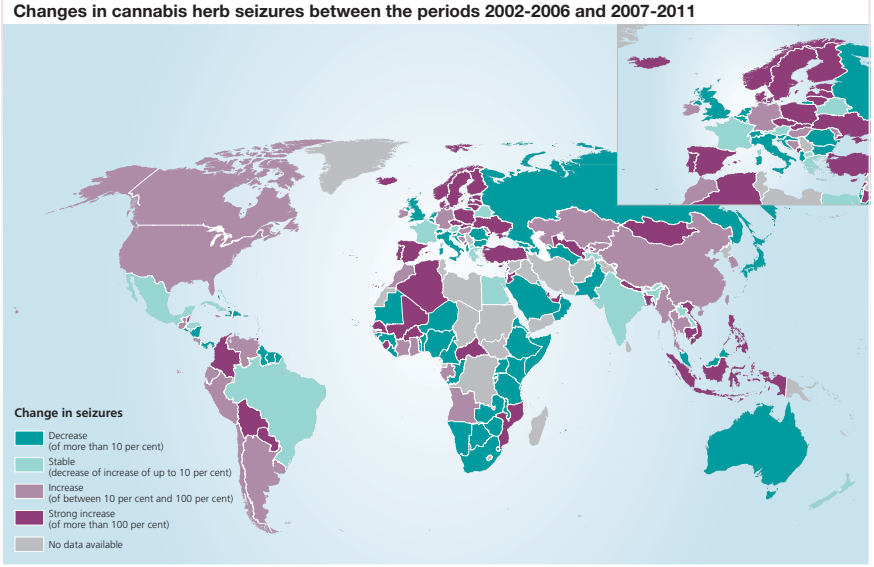
Region or subregion	Cocaine						ATS (excluding "ecstasy")						"Ecstasy"					
	Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)			Number (thousands)			Prevalence (percentage)		
	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper	Best estimate	Lower	Upper
Africa	**2,540**	**820**	**4,570**	**0.4**	**0.1**	**0.8**	**5,130**	**1,340**	**8,840**	**0.9**	**0.2**	**1.5**	**1,060**	**340**	**1,860**	**0.2**	**0.1**	**0.3**
Eastern Africa	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
North Africa	30	30	40	0.02	0.02	0.03	780	270	1,310	0.6	0.2	1.0	-	-	-	-	-	-
Southern Africa	620	160	710	0.8	0.2	0.9	600	290	800	0.7	0.3	1.0	250	140	300	0.3	0.2	0.4
West and Central Africa	1,570	570	2,390	0.7	0.3	1.1	-	-	-	-	-	-	-	-	-	-	-	-
Americas	**8,240**	**7,960**	**8,570**	**1.3**	**1.3**	**1.4**	**5,930**	**5,450**	**6,520**	**1.0**	**0.9**	**1.0**	**3,190**	**2,920**	**3,570**	**0.5**	**0.5**	**0.6**
Caribbean	190	110	330	0.7	0.4	1.2	210	20	510	0.8	0.1	1.9	80	10	240	0.3	0.1	0.9
Central America	160	150	170	0.6	0.6	0.6	330	330	330	1.3	1.3	1.3	30	20	30	0.1	0.1	0.1
North America	4,600	4,490	4,700	1.5	1.5	1.5	3,990	3,930	4,040	1.3	1.3	1.3	2,720	2,700	2,750	0.9	0.9	0.9
South America	3,290	3,210	3,370	1.3	1.2	1.3	1,400	1,170	1,630	0.5	0.4	0.6	360	190	530	0.1	0.1	0.2
Asia	**1,310**	**420**	**2,190**	**0.05**	**0.02**	**0.08**	**19,130**	**4,460**	**33,810**	**0.7**	**0.2**	**1.2**	**10,570**	**2,610**	**18,520**	**0.4**	**0.1**	**0.7**
Central Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
East/ South-East Asia	470	360	1,070	0.03	0.02	0.07	8,740	3,390	19,820	0.6	0.2	1.3	3,100	1,610	6,430	0.2	0.1	0.4
Near and Middle East	90	50	130	0.03	0.02	0.05	420	360	780	0.2	0.1	0.3	-	-	-	-	-	-
South Asia	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Europe	**4,600**	**4,330**	**4,900**	**0.8**	**0.8**	**0.9**	**3,050**	**2,640**	**3,480**	**0.5**	**0.5**	**0.6**	**3,830**	**3,570**	**4,120**	**0.7**	**0.6**	**0.7**
East/ South-East Europe	560	310	830	0.2	0.1	0.4	870	500	1,260	0.4	0.2	0.5	1,320	1,090	1,560	0.6	0.5	0.7
West/ Central Europe	4,040	4,020	4,060	1.2	1.2	1.3	2,180	2,140	2,220	0.7	0.7	0.7	2,510	2,480	2,560	0.8	0.8	0.8
Oceania	**370**	**370**	**460**	**1.5**	**1.5**	**1.9**	**510**	**410**	**530**	**2.1**	**1.7**	**2.2**	**710**	**690**	**710**	**2.9**	**2.9**	**2.9**
GLOBAL ESTIMATE	**17,060**	**13,910**	**20,690**	**0.4**	**0.3**	**0.5**	**33,750**	**14,300**	**53,170**	**0.7**	**0.3**	**1.2**	**19,360**	**10,140**	**28,780**	**0.4**	**0.2**	**0.6**

Source: UNODC estimates based on annual report questionnaire data and other official sources.

ANNEX II
MAPS AND TABLES ON DRUG SUPPLY

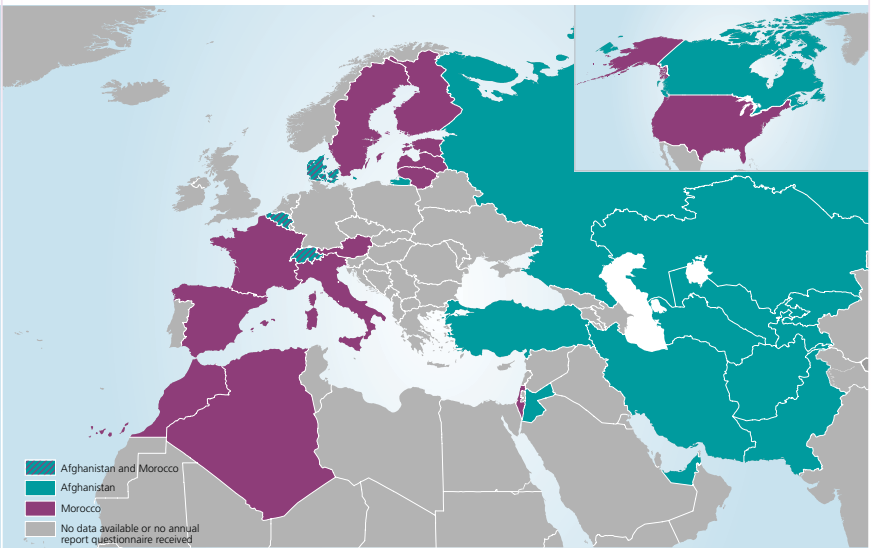
Cannabis trafficking

Changes in cannabis herb seizures between the periods 2002-2006 and 2007-2011



Source: UNODC annual report questionnaire data, supplemented by other sources.

Countries reporting Afghanistan and/or Morocco as the main source of cannabis resin seized between 2009 and 2011



Source: UNODC, data from the annual report questionnaire and other official sources.

Trafficking: most frequently mentioned countries of provenance

Most frequently mentioned countries of provenance[a] for individual drug seizure cases, by drug type (all modes of transportation), 2001-2012

Rank	Cannabis	Cocaine (base, salts and crack)	Heroin	ATS
1	Morocco	Brazil	Afghanistan	Netherlands
2	Afghanistan	Colombia	Pakistan	Lao People's Democratic Republic
3	Jamaica	Argentina	Tajikistan	Germany
4	Netherlands	Dominican Republic	Albania	United Kingdom
5	South Africa	Venezuela (Bolivarian Republic of)	Turkey	Myanmar
6	Paraguay	Peru	Netherlands	Cambodia
7	Ghana	Jamaica	Iran (Islamic Republic of)	Iran (Islamic Republic of)
8	Spain	Bolivia (Plurinational State of)	India	Belgium
9	Nepal	Costa Rica	Thailand	China
10	Albania	Netherlands	Kyrgyzstan	United States
11	Algeria	Ecuador	Belgium	Hong Kong, China
12	Mozambique	Mexico	Bulgaria	Malaysia
13	Pakistan	Panama	Kazakhstan	Bulgaria
14	Honduras	Nigeria	Germany	Poland
15	India	Ghana	Nigeria	France
16	Iran (Islamic Republic of)	Spain	Greece	Denmark
17	Kazakhstan	Guinea	Uzbekistan	Czech Republic
18	Haiti	Chile	Myanmar	Canada
19	United States	Senegal	Spain	Syrian Arab Republic
20	France	Trinidad and Tobago	Hong Kong, China	Lithuania

Source: United Nations Office on Drugs and Crime, individual drug seizure database.

[a] Reporting countries are asked to provide information about the country where the drugs were obtained (or, in the case of unaccompanied shipments, the departure country). For the purposes of the above table, this is considered as the provenance of the drug. However, countries are also asked to provide information on the country of origin, where the drugs were produced or manufactured. In cases in which the country where the drugs were obtained is not specified, or coincides with the country that made the seizure, the country of origin is taken as the provenance. In order to reflect patterns in transnational trafficking, any cases where the provenance coincides with the country making the seizure are excluded.

Most frequently mentioned countries of provenance[a] for individual maritime drug seizure cases, 2001-2012

Rank	Country	Main drugs
1	Morocco	Cannabis resin
2	Netherlands	Cannabis herb, cannabis resin, cocaine, heroin
3	Colombia	Cocaine
4	Ecuador	Cocaine
5	Iran (Islamic Republic of)	Cannabis resin, opium, heroin
6	France	Cannabis resin, cannabis herb, cocaine, heroin
7	Afghanistan	Heroin, cannabis resin
8	Belgium	Cannabis herb, cannabis resin, cocaine, "ecstasy", heroin
9	Spain	Cannabis resin, cocaine
10	Peru	Cocaine
11	Venezuela (Bolivarian Republic of)	Cocaine
12	Jamaica	Cannabis herb, cocaine
13	Pakistan	Heroin, cannabis resin
14	Germany	Cannabis herb, cannabis resin, cocaine, "ecstasy"
15	Costa Rica	Cocaine
16	Brazil	Cocaine
17	China	Pseudoephedrine, cannabis herb, heroin, methamphetamine
18	Panama	Cocaine
19	Bolivia (Plurinational State of)	Cocaine
20	Chile	Cocaine

Source: United Nations Office on Drugs and Crime, individual drug seizure database.

[a] Reporting countries are asked to provide information about the country where the drugs were obtained (or, in the case of unaccompanied shipments, the departure country). For the purposes of the above table, this is considered as the provenance of the drug. However, countries are also asked to provide information on the country of origin, where the drugs were produced or manufactured. In cases in which the country where the drugs were obtained is not specified, or coincides with the country which made the seizure, the country of origin is taken as the provenance. For that reason, the table includes countries that do not have access to the sea. In order to reflect patterns in transnational trafficking, any cases in which the provenance coincides with the country making the seizure are excluded.

Cannabis cultivation, production and eradication

Update of information available on cannabis cultivation and production in major producing countries, 2011

Country	Area under cultivation (hectares)	Area eradicated (hectares)	Area under cultivation after eradication (hectares)	Production (tons) Cannabis herb	Production (tons) Cannabis resin
Afghanistan[a]	12,000		..	..	1,300
India	..	1,112	..	..	..
Indonesia	..	306	..	..	..
Jamaica	..	373	..	..	..
Mexico	12,000[b]	13,430	..	17,915	..
Morocco	..	8,000	47,500	38,000[c]	760
Nigeria	918.0	918	..	..	..
Ukraine	..	281	..	..	..

[a] Information from the cannabis survey conducted by United Nations Office on Drugs and Crime in Afghanistan in 2011.
[b] Source: United States, Department of State, Bureau for International Narcotics and Law Enforcement Affairs, International Narcotics Control Strategy Report, vol. 1, Drug and Chemical Control (March 2013). The Government of Mexico does not validate the estimates provided by the United States, as they are not part of its official figures and it does not have information on the methodology used to calculate them. The Government of Mexico has started implementing a monitoring system in collaboration with UNODC to estimate illicit cultivation and production, for which the first results are expected in 2013.
[c] Refers to kif.

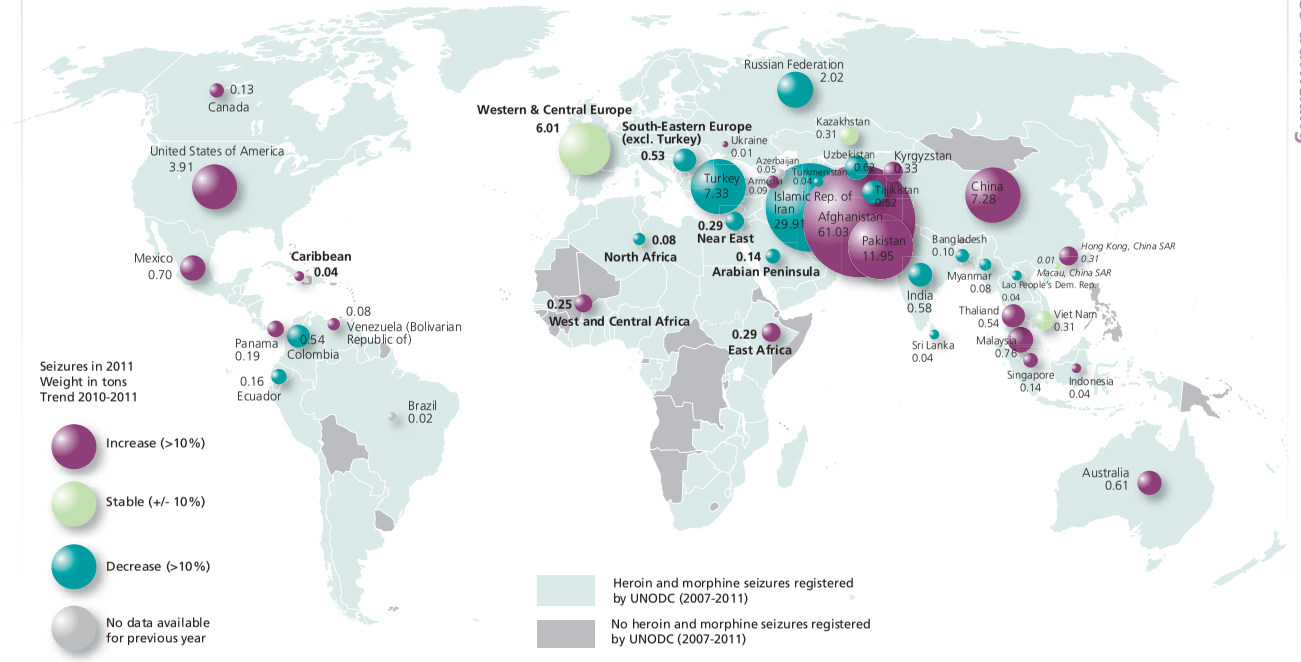
Plants and sites eradicated for selected countries, in 2011

2011	Outdoor sites		Indoor sites		Average number of plants per site[a]	
Country	Plants eradicated	Sites eradicated	Plants eradicated	Sites eradicated	Outdoors	Indoors
Albania	21,267	89			239	
Australia	40,879	56	18,216	223	730	82
Azerbaijan	2,961	51			58	
Belgium	2,122	123	330,178	947	17	349
Brazil	1,336,182	60			22,270	
Costa Rica	1,489,259	166	146	4	8,971	37
Ecuador	650	6			108	
Hungary	621		13,500			
Indonesia	1,839,664	40			45,992	
Italy	1,005,814		2,522			
Jamaica	1,053,000					
Kazakhstan	79,470	228			349	
Latvia	833	1	375	8	833	47
Netherlands	59		1,819,776	5,435		335
New Zealand	118,259	2,131	21,202	783	55	27
Philippines	3,955,546	129			30,663	
Tajikistan	2,113,464					
Uganda	20,000	5			4,000	
Ukraine	1,540,000	98,000			16	
United States of America[b]	9,866,766	23,622	462,419	4,721	418	98

[a] Calculated based on reported information on plants and sites eradicated. The reported number of sites might not directly correspond to the number of plants reported and there is no common, standardized definition of site or plant: plants may or may not include small plants and/or seedlings, and sites might be counted even if they contained no plants or seedlings at the time of dismantlement.

[b] Data from 2010, as reported in the annual report questionnaire for 2011.

Global seizures of heroin and morphine, 2011



Source: UNODC annual report questionnaire data, supplemented by other sources.

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations. Dashed lines represent undetermined boundaries. The dotted line represents approximately the Line of Control in Jammu and Kashmir agreed upon by India and Pakistan. The final status of Jammu and Kashmir has not yet been agreed upon by the parties. The final boundary between the Sudan and South Sudan has not yet been determined.

Opium/heroin cultivation, production and eradication

Net cultivation of opium poppy in selected countries, 1998-2012 (Hectares)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SOUTH-WEST ASIA															
Afghanistan	63,674	90,583	82,171	7,606	74,100	80,000	131,000	104,000	165,000	193,000	157,000	123,000	123,000	131,000	154,000
Pakistan	950	284	260	213	622	2,500	1,500	2,438	1,545	1,701	1,909	1,779	1,721	362	382
Subtotal	64,624	90,867	82,431	7,819	74,722	82,500	132,500	106,438	166,545	194,701	158,909	124,779	124,721	131,362	154,382
SOUTH-EAST ASIA															
Lao People's Democratic Republic [a]	26,837	22,543	19,052	17,255	14,000	12,000	6,600	1,800	2,500	1,500	1,600	1,900	3,000	4,100	6,800
Myanmar [a]	130,300	89,500	108,700	105,000	81,400	62,200	44,200	32,800	21,500	27,700	28,500	31,700	38,100	43,600	51,000
Thailand [b]	716	702	890	820	750										
Viet Nam [b]	442	442													
Subtotal	158,295	113,187	128,642	123,075	96,150	74,200	50,800	34,600	24,000	29,200	30,100	33,600	41,100	47,700	57,800
LATIN AMERICA															
Colombia	7,350	6,500	6,500	4,300	4,153	4,026	3,950	1,950	1,023	715	394	356	341	338	
Mexico [c]	5,500	3,600	1,900	4,400	2,700	4,800	3,500	3,300	5,000	6,900	15,000	19,500	14,000	12,000	
Subtotal	12,850	10,100	8,400	8,700	6,853	8,826	7,450	5,250	6,023	7,615	15,394	19,856	14,341	12,338	*12,338*
OTHER															
Other countries [d]	2,050	2,050	2,479	2,500	2,500	3,074	5,190	5,212	4,432	4,184	8,600	7,700	10,500	16,100	*11,800*
TOTAL	**237,819**	**216,204**	**221,952**	**142,094**	**180,225**	**168,600**	**195,940**	**151,500**	**201,000**	**235,700**	**213,003**	**185,935**	**190,662**	**207,500**	***236,320***

Source: For Afghanistan: 1998-2002: UNODC; 2003-2012: National Illicit Crop Monitoring System supported by UNODC. For Pakistan: annual report questionnaire, Government of Pakistan, United States Department of State. For the Lao People's Democratic Republic: 1998-1999: UNODC; 2000-2012: National Illicit Crop Monitoring System supported by UNODC. For Myanmar: 1998-2000: United States Department of State; 2001-2012: National Illicit Crop Monitoring System supported by UNODC. For Colombia: 1998-1999: various sources; From 2000: National Illicit Crop Monitoring System supported by UNODC. For 2008-2012, production was calculated based on regional yield figures and conversion ratios from the United States Department of State/DEA. For Mexico: estimates derived from United States Government surveys.

Note: Figures in italics are preliminary and may be revised when updated information becomes available. Information on estimation methodologies and definitions can be found in the methodology section of the online version of the present report.

[a] May include areas that were eradicated after the date of the area survey.

[b] Owing to continuing low cultivation, figures for Viet Nam (as of 2000) and Thailand (as of 2003) were included in the category "Other countries".

[c] The Government of Mexico does not validate the estimates provided by the United States, as they are not part of its official figures and it does not have information on the methodology used to calculate them. The Government of Mexico is in the process of implementing a monitoring system in collaboration with UNODC to estimate illicit cultivation and production.

d Eradication and plant seizure reports from different sources indicate that illicit opium poppy cultivation also exists in the following subregions: North Africa, Central Asia and Transcaucasia, Near and Middle East/South-West Asia, South Asia, East and South-East Asia, Eastern Europe, South-Eastern Europe, Central America and South America. Starting in 2008, a new methodology was introduced to estimate opium poppy cultivation and opium/heroin production in those countries. The estimates are higher than the previous figures but have a similar order of magnitude. A detailed description of the estimation methodology is available in the online version of the present report.

Global potential production of opium and manufacture of heroin of unknown purity, 2004-2012 (Tons)

	2004	2005	2006	2007	2008	2009	2010	2011	2012
Total potential opium production	**4,850**	**4,620**	**5,810**	**8,091**	**6,841**	**4,953**	**4,730**	**6,983**	***4,905***
Potential opium not processed into heroin	1,197	1,169	1,786	3,078	2,360	1,680	1,728	3,400	1,850
Potential opium processed into heroin	3,653	3,451	4,024	5,012	4,481	3,273	3,002	3,583	*3,055*
Total potential heroin manufacture	**529**	**472**	**553**	**686**	**600**	**427**	**383**	**476**	***311***

Note: The proportion of potential opium production not converted into heroin could be estimated only for Afghanistan. For the purpose of this table, for all other countries it is assumed that all opium potentially produced is converted into heroin. If total potential opium production in Afghanistan in 2012 were converted into heroin, total potential heroin production would be 529 tons (Afghanistan) and 576 tons (global).

Figures in italics are preliminary and may be revised when updated information becomes available.

Potential production of oven-dry opium in selected countries, 1998-2012 (Tons)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
SOUTH-WEST ASIA															
Afghanistan	2,693	4,565	3,276	185	3,400	3,600	4,200	4,100	5,300	7,400	5,900	4,000	3,600	5,800	3,700
Pakistan	26	9	8	5	5	52	40	36	39	43	48	44	43	9	9
Subtotal	2,719	4,574	3,284	190	3,405	3,652	4,240	4,136	5,339	7,443	5,948	4,044	3,643	5,809	*3,709*
SOUTH-EAST ASIA															
Lao People's Democratic Republic	124	124	167	134	112	120	43	14	20	9	10	11	18	25	41
Myanmar	1,303	895	1,087	1,097	828	810	370	312	315	460	410	330	580	610	690
Thailand [a]	8	8	6	6	9										
Viet Nam [a]	2	2													
Subtotal	1,437	1,029	1,260	1,237	949	930	413	326	335	469	420	341	598	635	731
LATIN AMERICA															
Colombia	100	88	88	80	52	50	49	24	13	14	10	9	8	8	
Mexico [b]	60	43	21	91	58	101	73	71	108	150	325	425	300	250	
Subtotal	160	131	109	171	110	151	122	95	121	164	335	434	308	258	*258*
OTHER															
Other countries [c]	30	30	38	32	56	50	75	63	16	15	139	134	181	281	*207*
TOTAL	**4,346**	**5,764**	**4,691**	**1,630**	**4,520**	**4,783**	**4,850**	**4,620**	**5,810**	**8,091**	**6,841**	**4,953**	**4,730**	**6,983**	***4,905***

Source: For Afghanistan: 1998-2002: UNODC; 2003-2012: National Illicit Crop Monitoring System supported by UNODC. For Pakistan: annual report questionnaire, Government of Pakistan, United States Department of State. For the Lao People's Democratic Republic: 1998-1999: UNODC; 2000-2012: National Illicit Crop Monitoring System supported by UNODC. For Myanmar: 1998-2000: United States Department of State; 2001-2012: National Illicit Crop Monitoring System supported by UNODC. For Colombia: 1998-1999: various sources; From 2000: National Illicit Crop Monitoring System supported by UNODC. For 2008-2012, production was calculated based on regional yield figures and conversion ratios from the United States Department of State/DEA. For Mexico: estimates derived from United States Government surveys.

Note: Figures in italics are preliminary and may be revised when updated information becomes available. Information on estimation methodologies and definitions can be found in the methodology section of the online version of the present report. The opium production estimates for Afghanistan for 2006-2009 were revised after data quality checks revealed an overestimation of opium yield estimates in those years.

[a] Owing to continuing low cultivation, figures for Viet Nam (as of 2000) and Thailand (as of 2003) were included in the category "Other countries".

[b] The Government of Mexico does not validate the estimates provided by the United States, as they are not part of its official figures and it does not have information on the methodology used to calculate them. The Government of Mexico is in the process of implementing a monitoring system in collaboration with UNODC to estimate illicit cultivation and production.

[c] Eradication and plant seizure reports from different sources indicate that illicit opium poppy cultivation also exists in the following subregions: North Africa, Central Asia and Transcaucasia, Near and Middle East/South-West Asia, South Asia, East and South-East Asia, Eastern Europe, South-Eastern Europe, Central America and South America. Starting in 2008, a new methodology was introduced to estimate opium poppy cultivation and opium/heroin production in those countries. The estimates are higher than the previous figures but have a similar order of magnitude. A detailed description of the estimation methodology is available in the online version of the present report.

Reported opium poppy eradication in selected countries, 2003 to 2012 (Hectares)

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Afghanistan	21,430	[a]	5,103	15,300	19,047	5,480	5,351	2,316	3,810	9,672
Bangladesh								8	22	
Colombia	3,266	3,866	2,121	1,929	375	381	546	711	299	309
Egypt	34	65	45	50	98	121	89	222	1	
Guatemala			489	720	449	536	1,345	918	1,490	
India	494	167	12	247	8,000	624	2,420	3,052	5,746	
Lao People's Democratic Republic	4,134	3,556	2,575	1,518	779	575	651	579	662	707
Lebanon	4	67	27		8		21		4	
Mexico	20,034	15,926	21,609	16,890	11,046	13,095	14,753	15,491	16,389	
Myanmar	638	2,820	3,907	3,970	3,598	4,820	4,087	8,268	7,058	23,718
Nepal	19	4		1		21	35			
Pakistan	4,185	5,200	391	354	614	0	105	68	1,053	592
Peru	57	98	92	88	28	23	32	21		
Thailand	767	122	110	153	220	285	201	278	208	205
Ukraine						28		436		
Venezuela (Bolivarian Republic of)	0	87	154	0	0	0				
Viet Nam	100	32			38	99	31		38	

Source: United Nations Office on Drugs and Crime; data from the annual report questionnaire; Government reports; reports of regional bodies; United States, Department of State, Bureau for International Narcotics and Law Enforcement Affairs, *International Narcotics Control Strategy Report*, vol. 1, *Drug and Chemical Control* (March 2013).

Note: Table covers only eradication reported in area units. Information on eradication reported as plant seizures can be found in the annex on seizures in the electronic version of the *World Drug Report*.

[a] Although eradication took place in 2004, it was not officially reported to UNODC.

Coca/cocaine cultivation, production and eradication

Global illicit cultivation of coca bush, 2002-2011 (Hectares)

	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Bolivia (Plurinational State of)	21,600	23,600	27,700	25,400	27,500	28,900	30,500	30,900	31,000	27,200
Colombia [a]	102,000	86,000	80,000	86,000	78,000	99,000	81,000	73,000	62,000	64,000
Peru [b]										62,500
Peru [c]	46,700	44,200	50,300	48,200	51,400	53,700	56,100	59,900	61,200	64,400
Total	**170,300**	**153,800**	**158,000**	**159,600**	**156,900**	**181,600**	**167,600**	**163,800**	**154,200**	**155,600** [d]

Source: For Bolivia (Plurinational State of), 2002: CICAD and United States Department of State, International Narcotics Control Strategy Report; since 2003: national illicit crop monitoring system supported by UNODC. For Colombia and Peru: national illicit crop monitoring system supported by UNODC.

Note: An account of the different concepts for different areas and their effect on comparability was presented in the *World Drug Report 2012* (pp. 41 and 42). In the continuing efforts to improve comparability of estimates between countries, for the first time the estimated net area under coca bush cultivation at the reference date of 31 December is presented for Peru in addition to the area under coca bush cultivation in Peru as seen on satellite imagery. The reference date of 31 December is also used for the estimated area under coca bush cultivation in Colombia. The estimates presented for the Plurinational State of Bolivia represent the area under coca bush cultivation as seen on satellite imagery.

[a] Net area on 31 December. Estimates from 2009 were adjusted for small fields, while estimates for previous years did not require that adjustment.
[b] Net area on 31 December.
[c] Area interpreted from satellite imagery.
[d] To maintain global comparability with past years, the global coca cultivation figure was calculated with the area interpreted from satellite imagery for Peru.

Potential production of sun-dried coca leaf in Bolivia (Plurinational State of) and Peru, 2005-2010 (Tons)

	2005	2006	2007	2008	2009	2010	2011
Bolivia (Plurinational State of)	28,200	33,200	36,400	39,400	40,100	40,900	33,500
Range			*34,200-38,300*	*37,300-41,800*	*37,900-42,300*	*38,600-43,100*	*31,900-35,400*
Peru	97,000	105,100	107,800	113,300	118,000	120,500	126,100
Range	*85,400-108,600*	*91,000-119,200*	*93,200-122,000*	*97,600-127,800*	*102,400-134,200*	*103,000-136,300*	*110,300-142,100*

Source: For Bolivia (Plurinational State of): potential production of sun-dried coca leaf available for cocaine manufacture is estimated by the national illicit crop monitoring system supported by UNODC. Source of estimates for leaf yield is UNODC for Yungas of La Paz and United States DEA for Chapare. The estimated amount of coca leaf produced on 12,000 ha in the Yungas of La Paz, where coca bush cultivation is authorized under national law, was deducted (range: upper and lower bounds of the 95 per cent confidence interval of the estimated coca leaf yield). For Peru: potential production of sun-dried coca leaf available for cocaine manufacture is estimated by the national illicit crop monitoring system supported by UNODC. A total of 9,000 tons of sun-dried coca leaves was deducted, which is the amount used for traditional purposes according to Government sources (range: upper and lower bounds of the 95 per cent confidence interval of the estimated coca leaf yield). To maintain comparability with past years, coca leaf production was calculated with the area interpreted from satellite imagery.

Note: The ranges reflect the uncertainty associated with the estimates. For Bolivia (Plurinational State of) and Peru, the ranges are based on confidence intervals and the best estimate is the mid-point between the upper and lower bounds of the range.

Potential production of fresh coca leaf and coca leaf in oven-dried equivalent in Colombia, 2005-2011 (Tons)

	2005	2006	2007	2008	2009	2010	2011
FRESH COCA LEAF							
Colombia	*555,400*	*528,300*	*525,300*	*389,600*	*343,600*	305,300	263,800
Range						*305,300-349,600*	
COCA LEAF IN OVEN-DRIED EQUIVALENT							
Colombia	*164,280*	*154,130*	*154,000*	*116,900*	*103,100*	91,600	79,100
Range						*91,600-104,880*	

Source: National illicit crop monitoring system supported by UNODC. Due to the introduction of an adjustment factor for small fields, estimates for 2010 and 2011 are not directly comparable with previous years.

Note: The ranges reflect the uncertainty associated with the estimates. The range represents the two approaches taken to calculate the productive area, with the lower bound being closer to the estimation used in previous years. The methodology to calculate uncertainty ranges for production estimates is still under development and figures may be revised when more information becomes available.

Potential manufacture of cocaine with a purity of 100 per cent in Bolivia (Plurinational State of), Colombia and Peru, 2005-2011 (Tons)

	2005	2006	2007	2008	2009	2010	2011
Bolivia (Plurinational State of)	80	94	*104*	*113*			
Colombia	680	660	630	450	410	350	345
Range						*350-400*	
Peru	*260*	*280*	*290*	*302*			
Total	***1,020***	***1,034***	***1,024***	***865***			

Source: For Bolivia (Plurinational State of): Government calculations based on UNODC (Yungas of La Paz) and United States DEA scientific study (Chapare) coca leaf yield surveys. For Colombia: national illicit crop monitoring system supported by UNODC and DEA scientific studies. Due to the introduction of an adjustment factor for small fields, estimates for 2010 and 2011 are not directly comparable with previous years. For Peru: Government calculations based on coca leaf to cocaine conversion ratio from DEA scientific studies. Detailed information on the ongoing revision of conversion ratios and cocaine laboratory efficiency is available in the *World Drug Report 2010*, p. 249-252.

Note: Due to the ongoing review of conversion factors, it has not been possible to provide a point estimate of the level of cocaine production since 2009. Because of the uncertainty surrounding the level of total potential cocaine production and concerning the comparability of the estimates between countries, the figures have been estimated as ranges (842-1,111 tons in 2009, 788-1,060 tons in 2010 and 776-1,051 tons in 2011). Figures in italics are under review. Information on estimation methodologies and definitions can be found in the section on methodology of the present report.

ANNEX III

Regional groupings

This report uses a number of regional and subregional designations. These are not official designations. They are defined as follows:

- East Africa: Burundi, Comoros, Djibouti, Eritrea, Ethiopia, Kenya, Madagascar, Mauritius, Rwanda, Seychelles, Somalia, Uganda and United Republic of Tanzania.
- North Africa: Algeria, Egypt, Libya, Morocco, South Sudan, Sudan and Tunisia.
- Southern Africa: Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia and Zimbabwe.
- West and Central Africa: Angola, Benin, Burkina Faso, Cameroon, Cape Verde, Central African Republic, Chad, Congo, Côte d'Ivoire, Democratic Republic of the Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone and Togo.
- Caribbean: Antigua and Barbuda, Bahamas, Barbados, Bermuda, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines and Trinidad and Tobago.
- Central America: Belize, Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama.
- North America: Canada, Mexico and United States of America.
- South America: Argentina, Bolivia (Plurinational State of), Brazil, Chile, Colombia, Ecuador, Guyana, Paraguay, Peru, Suriname, Uruguay and Venezuela (Bolivarian Republic of).
- Central Asia and Transcaucasia: Armenia, Azerbaijan, Georgia, Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan and Uzbekistan.
- East and South-East Asia: Brunei Darussalam, Cambodia, China, Democratic People's Republic of Korea, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Philippines, Republic of Korea, Singapore, Thailand, Timor-Leste and Viet Nam.
- Near and Middle East/South-West Asia: Afghanistan, Bahrain, Iran (Islamic Republic of), Iraq, Israel, Jordan, Kuwait, Lebanon, Oman, Pakistan, Qatar, Saudi Arabia, Syrian Arab Republic, United Arab Emirates and Yemen. The Near and Middle East refers to a subregion that includes Bahrain, Israel, Jordan, Kuwait, Lebanon, Oman, Qatar, Saudi Arabia, the Syrian Arab Republic, the United Arab Emirates and Yemen.
- South Asia: Bangladesh, Bhutan, India, Maldives, Nepal and Sri Lanka.
- Eastern Europe: Belarus, Republic of Moldova, Russian Federation and Ukraine.
- South-Eastern Europe: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, Montenegro, Romania, Serbia, the former Yugoslav Republic of Macedonia and Turkey.
- Western and Central Europe: Andorra, Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Monaco, Netherlands, Norway, Poland, Portugal, San Marino, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom of Great Britain and Northern Ireland.
- Oceania: Australia, Fiji, Kiribati, Marshall Islands, Micronesia (Federated States of), Nauru, New Zealand, Palau, Papua New Guinea, Samoa, Solomon Islands, Tonga, Tuvalu, Vanuatu and small island territories.

GLOSSARY

amphetamine-type stimulants — a group of substances comprised of synthetic stimulants from the group of substances called amphetamines, which includes amphetamine, methamphetamine, methcathinone and the "ecstasy"-group substances (methylenedioxymethamphetamine (MDMA) and its analogues)

annual prevalence — the total number of people of a given age range who have used a given drug at least once in the past year divided by the number of people of a given age range

coca paste (or coca base) — an extract of the leaves of the coca bush. Purification of coca paste yields cocaine (base and hydrochloride)

cocaine (base and salts) — coca paste, cocaine base and cocaine hydrochloride referred to in the aggregate

crack cocaine — cocaine base obtained from cocaine hydrochloride through conversion processes to make it suitable for smoking

new psychoactive substances — substances of abuse, either in a pure form or a preparation, that are not controlled by the Single Convention on Narcotic Drugs of 1961 or the Convention on Psychotropic Substances of 1971 but that may pose a public health threat. In this context, the term "new" does not necessarily refer to newly invented substances but rather to substances that have recently become available

opiates — a subset of opioids comprised of the various products derived from the opium poppy plant, including opium, morphine and heroin

opioids — a generic term applied to alkaloids from opium poppy, their synthetic analogues, and compounds synthesized in the body

poppy straw — all parts (except the seeds) of the opium poppy, after mowing

problem drug users — people who engage in the high-risk consumption of drugs, for example people who inject drugs, people who use drugs on a daily basis and/or people diagnosed as drug-dependent based on clinical criteria contained in the *International Classification of Diseases* (tenth revision) of the World Health Organization and the *Diagnostic and Statistical Manual of Mental Disorders* (fourth edition) of the American Psychiatric Association, or any similar criteria or definition that may be used

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The *World Drug Report* presents a comprehensive overview of the latest developments in drug markets. It covers production, trafficking, consumption and the related health consequences. Chapter 1 of this year's Report examines the global situation and the latest trends in the different drug markets and the extent of illicit drug use, as well as the related health impact. Chapter 2 addresses the issue of new psychoactive substances (substances of abuse that are not controlled by the Drug Conventions, but which may pose a public health threat), a phenomenon that can have deadly consequences for their users, but which is hard to control with its dynamic producers and fast-mutating "product lines" which have emerged over the last decade.

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